677
TR-2

TEXTILE MANUFACTURER

MATERIALS · PROCESSES · PRODUCTION · MANAGEMENT

Monthly: Two Shillings and Sixpence ESTABLISHED 1875 DECEMBER 1958

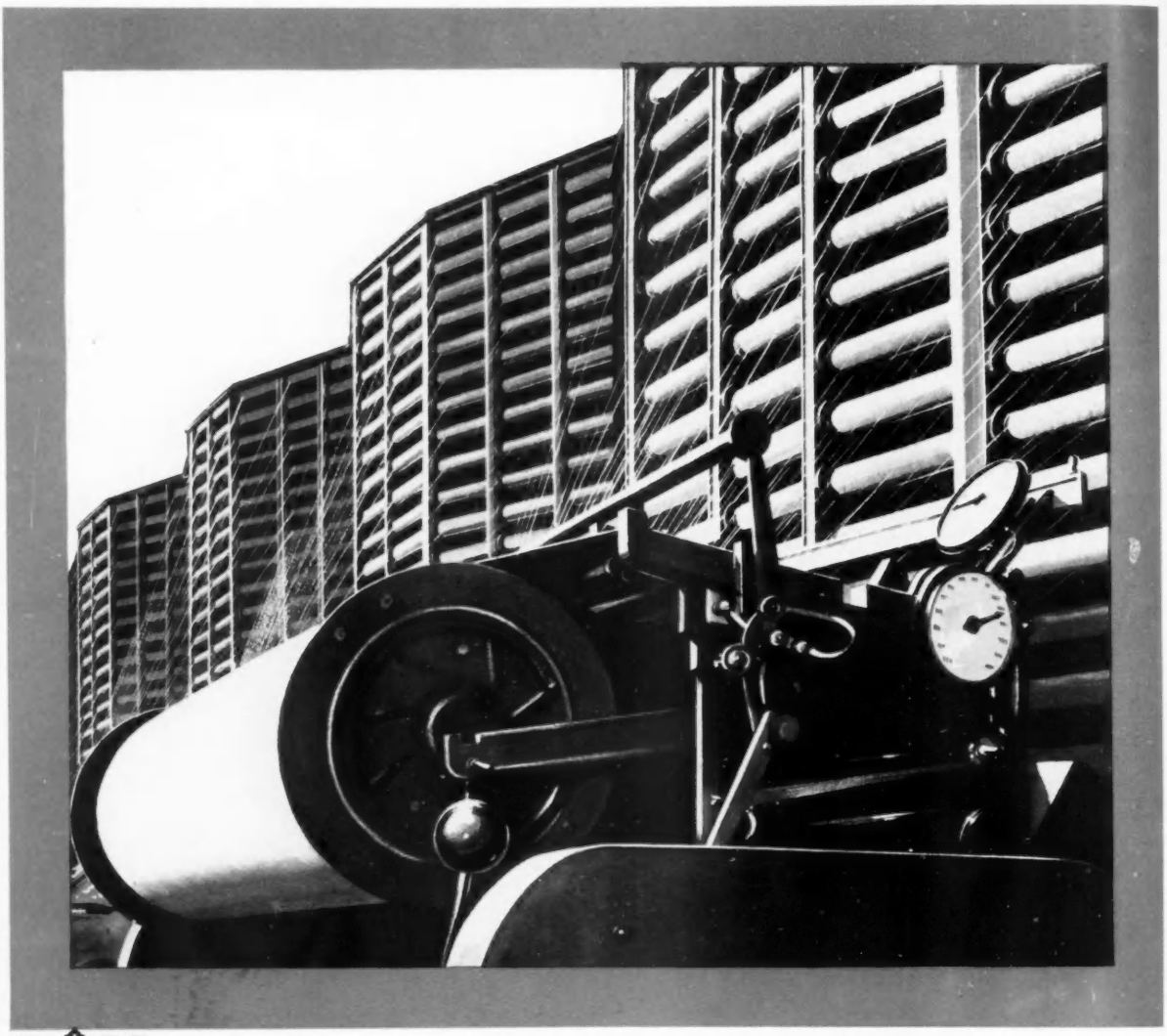
THE JOHN CRERAR LIBRARY
JAN 5 - 1959

Carpet Looms

In all widths for

★ SINGLE WIRE WILTONS · · ·
★ DOUBLE SHUTTLE WILTONS · ·
★ PLAIN OR JACQUARD · · ·
★ IMITATION PERSIAN CARPETS
★ HAIRCORD CARPETS · · · · ·
★ SISAL CARPETS · · · · · ·

WILSON & LONGBOTTOM *Ltd.*
BARNSLEY · ENGLAND



R&M make a vital contribution to a vital industry

Ransome and Marles have enjoyed a long and close association with textile engineers. We provide bearings for a large number of firms in this country and abroad — our products go into cloth-cutting machines, carpet machines, jute machines, lace machines. And, of course, the manufacturers of general textile machinery are among our largest customers — they total well over a hundred.

That sounds pretty impressive.

It is. And since the British textile industry is one of the oldest mechanised industries in the world, it's a tribute to us that we should be entrusted with providing bearings with a long life and low maintenance costs. The availability of spares in the textile-producing regions is vital. All offices have replacement bearings always in stock. To avoid delivery delays, we run our own transport fleet and at short notice an R&M specialist can be available to advise on installation.

I suppose another advantage to the textile manufacturers is the location of your headquarters ?

You mean within easy reach of the North Country ? Yes, it's valuable both to us and to our customers. For instance, the designer working on new machinery for producing synthetic fibres is able to work in closer consultation with our Technical Department. In fact, our resources can be very speedily brought to bear on *any* textile machinery problem.

RANSOME & MARLES BEARING CO LTD · NEWARK-ON-TRENT · ENGLAND

TELEPHONE · NEWARK 456 AND TELEX 37-306

BALL & ROLLER R&M BEARINGS

Good News for the spinner!

- LARGER PACKAGES AT HIGHER SPEEDS
- OIL FREE YARN AND TAPES
- LESS VIBRATION — MORE UNIFORM YARN
- SPECIAL ANTI-FRICTION BEARINGS REDUCE POWER CONSUMPTION AND HEAT GENERATION
- DOUBLE BEARING SUPPORT MINIMISES WEAR AND REPAIR

'NEW WORLD' SPINDLE

MANUFACTURED UNDER LICENCE FROM SACO-LOWELL SHOPS

We are now in a position to offer the New World Spindle in quantities to suit your requirements.

Over 3,000,000 of this type of spindle are already in daily use in mills throughout the world.

The New World Spindle can be fitted to old or new frames.

Send for our new folder.

BODDEN

MAKERS OF FINE SPINDLES AND FLYERS SINCE 1858

Telephone MAin (Oldham) 3818

WILLIAM BODDEN & SON LTD. : HARGREAVES WORKS : OLDHAM : LANCS

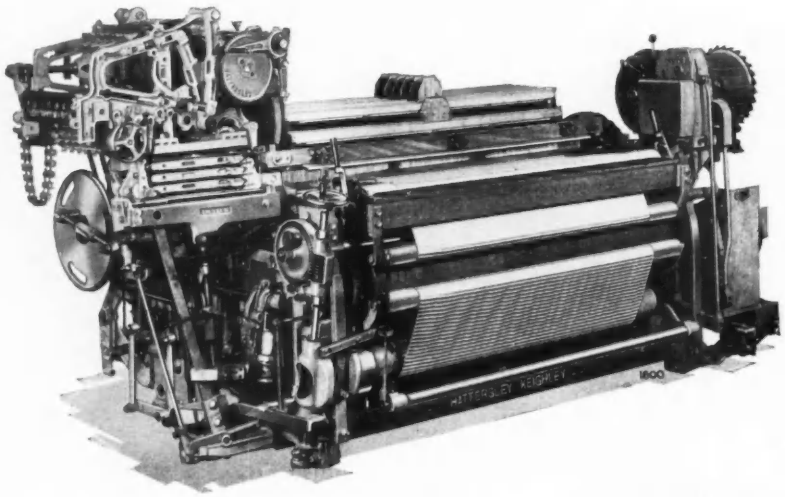
Hattersley

AUTOMATIC LOOMS

for Weaving Silk and Rayon Fabrics

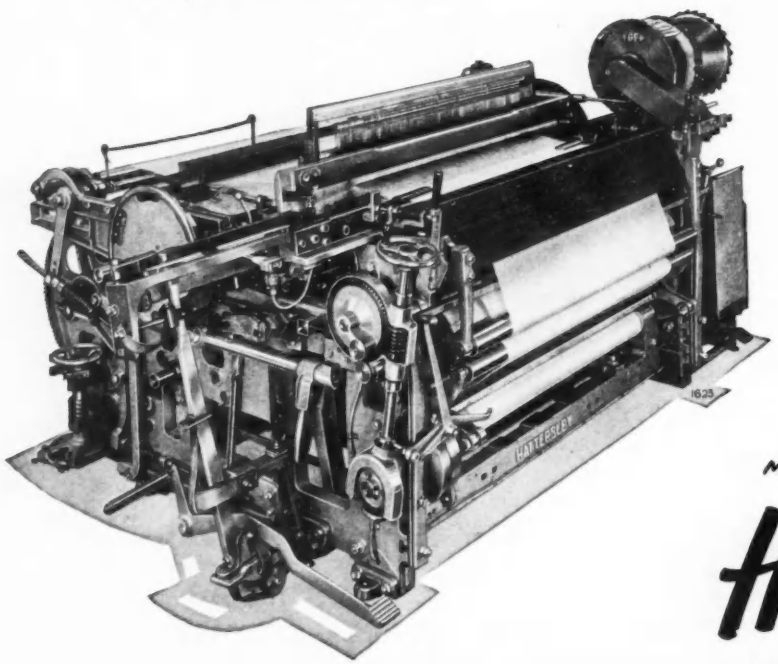
The Hattersley range of Silk and Rayon Looms embody all the essential requirements to meet the demands imposed by the latest filament yarns.

The range offers the alternative of two types of automatic weft replenishing motions for 4, 2, or 1 colour of weft. For automatic pirn changing there is the +GF+ pirn changing mechanism, and for automatic shuttle changing the well proved Hattersley shuttle change motion.



For pick-and-pick weaving there are non-automatic models with 4 or 2 boxes at each side of the loom. Shedding is by Jacquard, 24 sh. Cam Dobby with either paper card reading mechanism or lags and pegs, 10-shaft cam box, or 4-shaft positive inside treading.

Other features in these jig built looms include choice of three alternative let-off motions, electrical or mechanical warp stop motions.



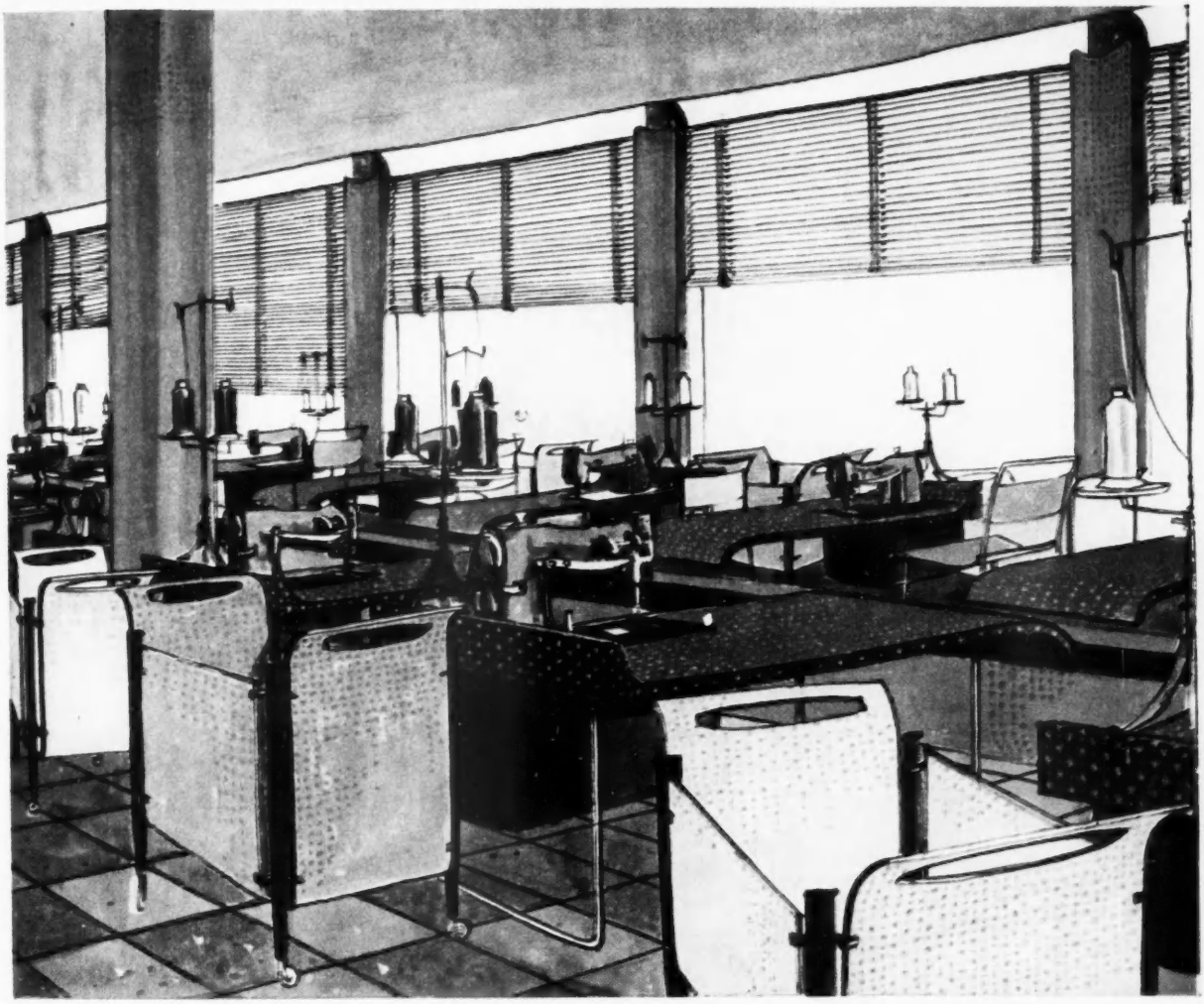
MADE BY

Hattersley

THE OLDEST FIRM OF LOOM MAKERS IN THE WORLD

GEORGE HATTERSLEY & SON LTD.
KEIGHLEY Tel: 2275 Est: 1789

FORMICA*



CURVED SURFACES!

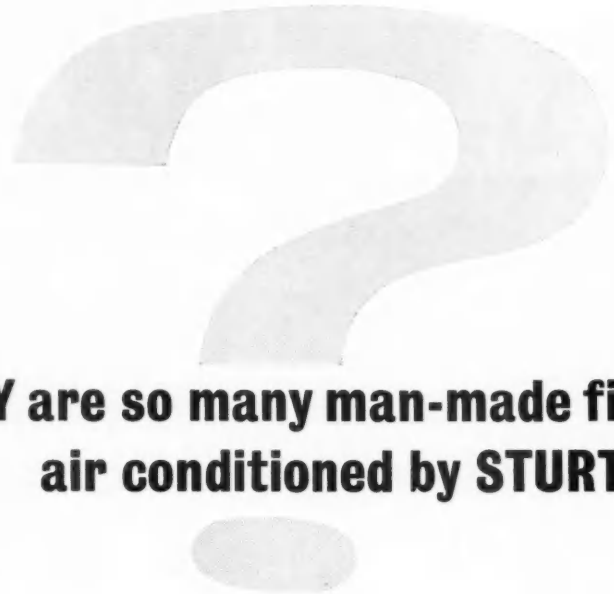
Formica Ltd have now perfected a development of great value to you! This is the new post-forming process, by which FORMICA decorative laminates can be shaped into curves to your design requirements.

Look at the picture above. You will get an idea of some of the possibilities if you refer to our picture. The qualities of FORMICA laminates generally—their hardness, smoothness, cleanness and ease of cleaning—are by now well known. The curvature of FORMICA surfaces lends, at the same time, new grace and new efficiency to design. Details of equipment or broad architectural features can all benefit. Pillars can be clad in any shape required. Wall panelling can be neatly rounded at corners . . .

Get in touch with us! Most qualified contractors are conversant now with the simple techniques involved. For fuller information, and full sample range, write to us at the address below.

FORMICA–the finest of all the decorative laminates

*FORMICA *is a registered trademark. Formica Ltd, Trade Post-forming Enquiries, De La Rue House, 84/86 Regent Street, London W1*



WHY are so many man-made fibre factories air conditioned by STURTEVANT?

BECAUSE

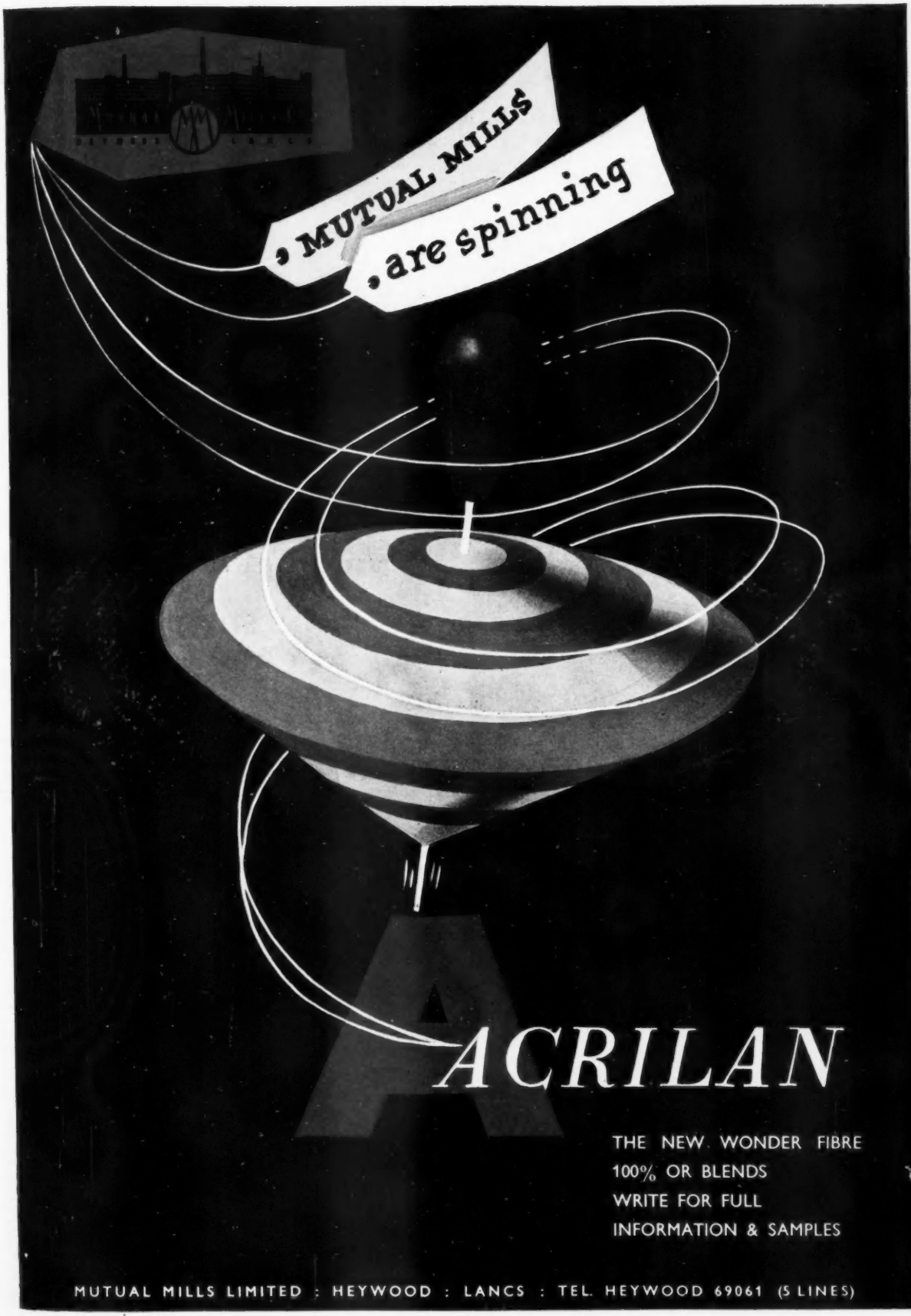
- STURTEVANT have unrivalled experience
- They have installed so many successful plants
- The equipment is robust
- Conditions are uniform
- Maintenance is easy
- Engineering services are excellent

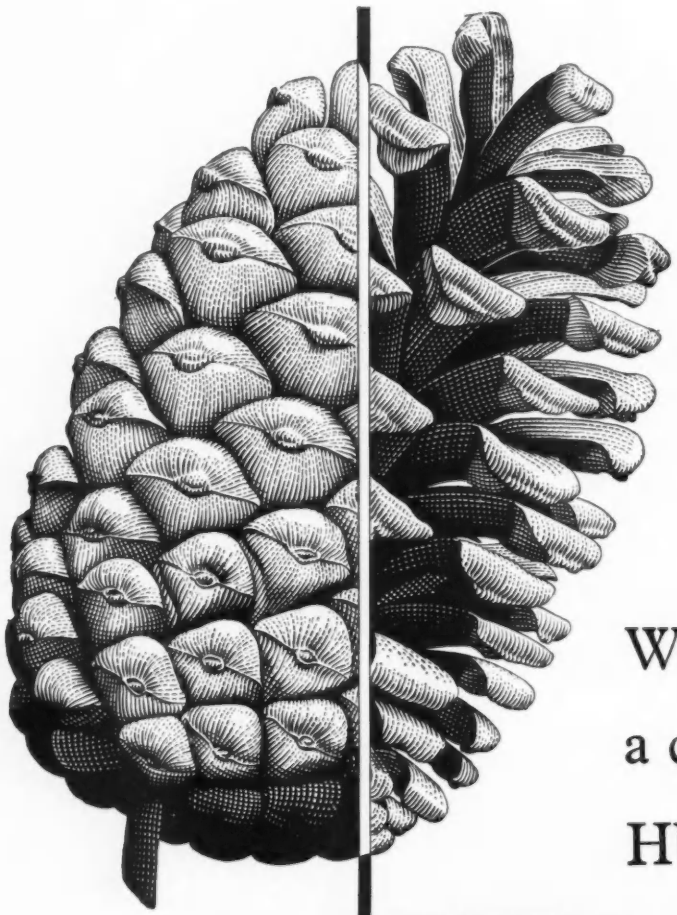
THAT'S WHY

For further particulars of Sturtevant Air Conditioning write for a copy of our new publication X4303

STURTEVANT ENGINEERING CO. LTD.
Southern House, Cannon Street, LONDON, E. C. 4.

AUSTRALIA: STURTEVANT ENGINEERING CO. (AUSTRALASIA) LTD. 400 SUSSEX STREET SYDNEY N.S.W.


MUTUAL MILLS
are spinning
ACRILAN
THE NEW WONDER FIBRE
100% OR BLENDS
WRITE FOR FULL
INFORMATION & SAMPLES
MUTUAL MILLS LIMITED : HEYWOOD : LANCS : TEL. HEYWOOD 69061 (5 LINES)



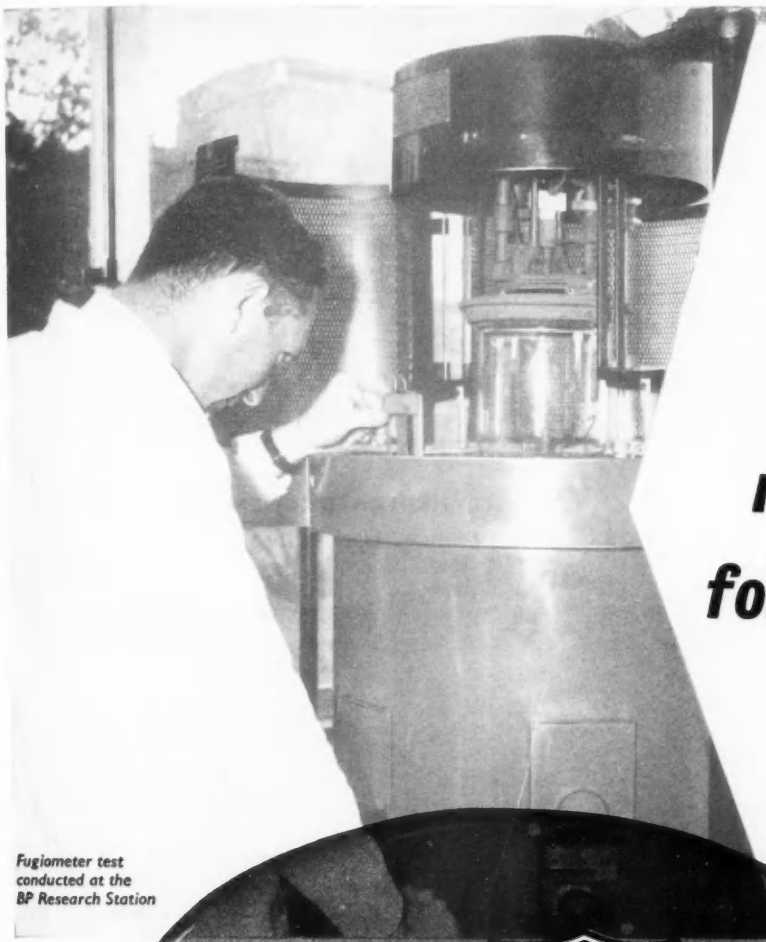
When it's
a question of
HUMIDITY

consult . . .

NEGRETTI & ZAMBRA

Manufacturers of instruments for the indication, recording, controlling of:— Temperature, pressure, liquid level, volume, specific gravity humidity, etc. Also meteorological and aircraft instruments.

NEGRETTI & ZAMBRA LIMITED,
122 REGENT STREET, LONDON, W.1
Telephone: REGent 3406. Telegrams: Negretti, Piccy, London.
BRANCHES: Birmingham, Cardiff, Glasgow, Leeds, Manchester, Nottingham.
Agents or Subsidiaries in most countries.



Fugiometer test conducted at the BP Research Station

A programme of constant research ensuring . . .

the finest range of oils for the textile industry

BP

ENERGOL

LUBRICANTS

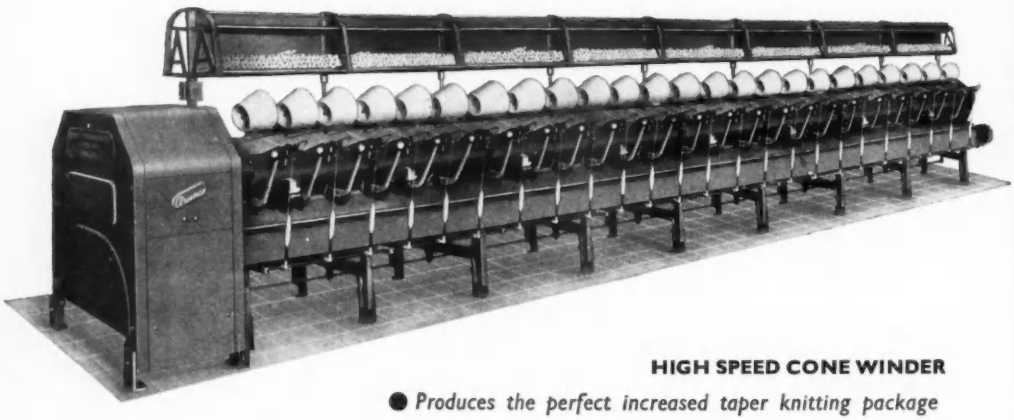
PRODUCTS OF THE BRITISH PETROLEUM COMPANY LTD

Distributors

THE POWER PETROLEUM CO. LTD.

Head Office: 76/86 STRAND · LONDON W.C.2 *(Branches and Depots throughout the country)*

Our Technical Department will be pleased to advise on your lubrication requirements and problems



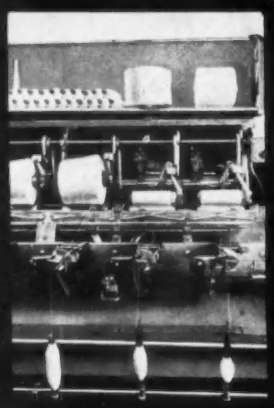
HIGH SPEED CONE WINDER

● *Produces the perfect increased taper knitting package*

Arunconer

HIGH SPEED

CONE WINDER



SOFT CHEESE and CONE WINDER

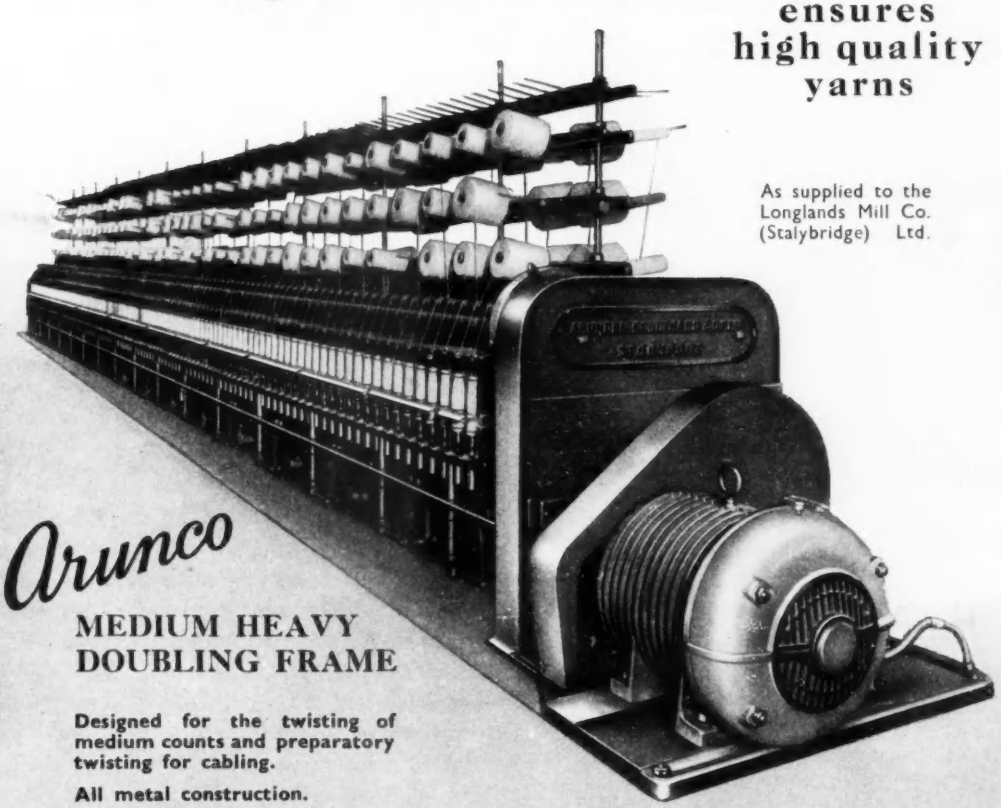
● *Produces the perfect package for pressure dyeing*

Specialists in Winding, Doubling and Gassing Machinery, also Spindles, Rings, etc., for the Doubling and Spinning Trade

ARUNDEL COULTHARD & COMPANY LIMITED, STOCKPORT Tel. 3871 *also at PRESTON*

ACS/PPPS/114

Rigid Construction ensures high quality yarns



As supplied to the Longlands Mill Co. (Stalybridge) Ltd.

Arunco

MEDIUM HEAVY DOUBLING FRAME

Designed for the twisting of medium counts and preparatory twisting for cabling.

All metal construction.

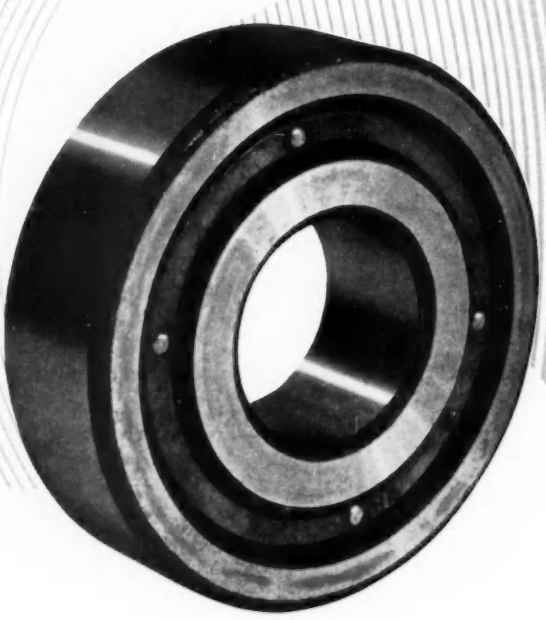
Rigid construction ensures high quality yarns.

SPECIALISTS IN WINDING, DOUBLING AND GASSING MACHINERY; ALSO SPINDLES, RINGS, Etc. FOR THE SPINNING AND DOUBLING TRADE

Arundel, Coulthard & Co. Ltd.

Telephone: STOCKPORT 3871 **Stockport** *Also at PRESTON*

WHAT A LIFE!



50

years of it, is the startling record of this Hoffmann Ball Bearing on a Royce crane. And after this marathon run, wear is imperceptible on the moving parts and only very slight damage to tracks, due to the ingress of foreign matter.

If you have a Hoffmann Bearing which has been in service for a similar period or longer, we should be most interested to have details. The bearing would naturally be Hoffmann, as we were then the only British manufacturers of the radial ball bearing.

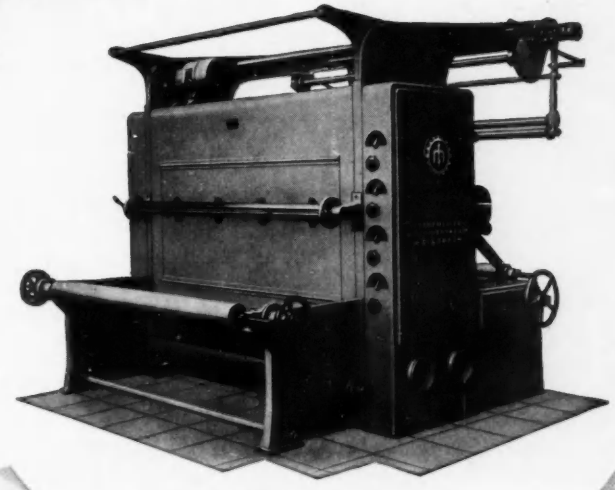
HOFFMANN BALL & ROLLER BEARINGS

BACKED BY 60 YEARS OF BEARING KNOWLEDGE AND EXPERIENCE

THE HOFFMANN MANUFACTURING CO. LTD., CHELMSFORD, ESSEX

WITH MÜLLER MACHINES

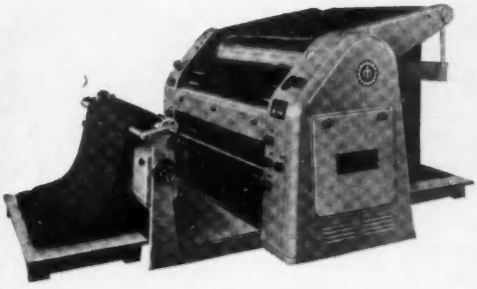
brushing



Brushing Machine, vertical design
with 2, 4 and 6 brushes

pressing

steaming



Cylinder Press J8

raising

TRI-Raising Machine
(also as Continuous Operation
Plants)

VEREINIGUNG VON TEXTILMASCHINENFABRIKEN COMBITEX

FRANZ MÜLLER MASCHINENFABRIK M.GLADBACH (WESTERN GERMANY)

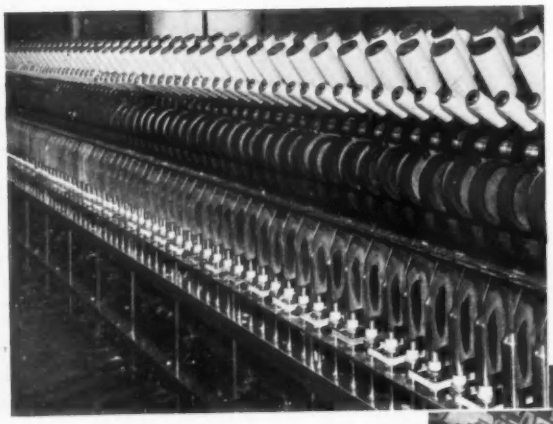
In Yorkshire they spin better*

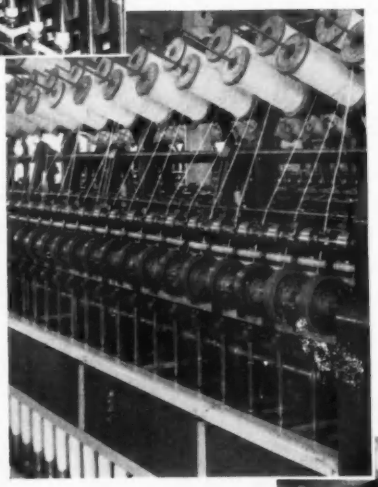
with

TICO

Synthetic Roller Coverings

TICO Coverings are suitable for English and Continental Spinning and Drawing in the Woollen Worsted and Allied Synthetic Fibre Industry.



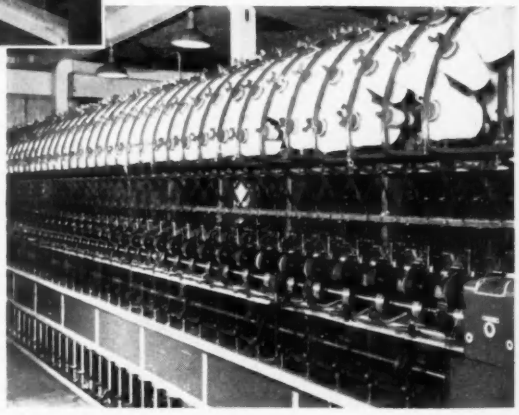


Some of their outstanding advantages :

- Clean running at all times.
- Unaffected by oils or creams.
- Reduced "fly."
- Less-than-normal tension needed.
- Pressing weight loading reductions of 50% are possible.

Further points of note :

- Cooler running.
- Perfect control on drafting.
- Ground to precision limits.
- Fewer end-breakages and more uniform sliver produced.



All types of roller coverings and accessories to the industry.

Sole Manufacturers and Head Office :

TEXTILE INDUSTRIAL COMPONENTS LTD.

WARSALL RD., WYTHENSHAWE, MANCHESTER 22

Phone : WYTHENSHAWE 3458/9. *Grams :* TICODRAFT Manchester.

ENQUIRIES for the WOOLLEN & WORSTED INDUSTRY

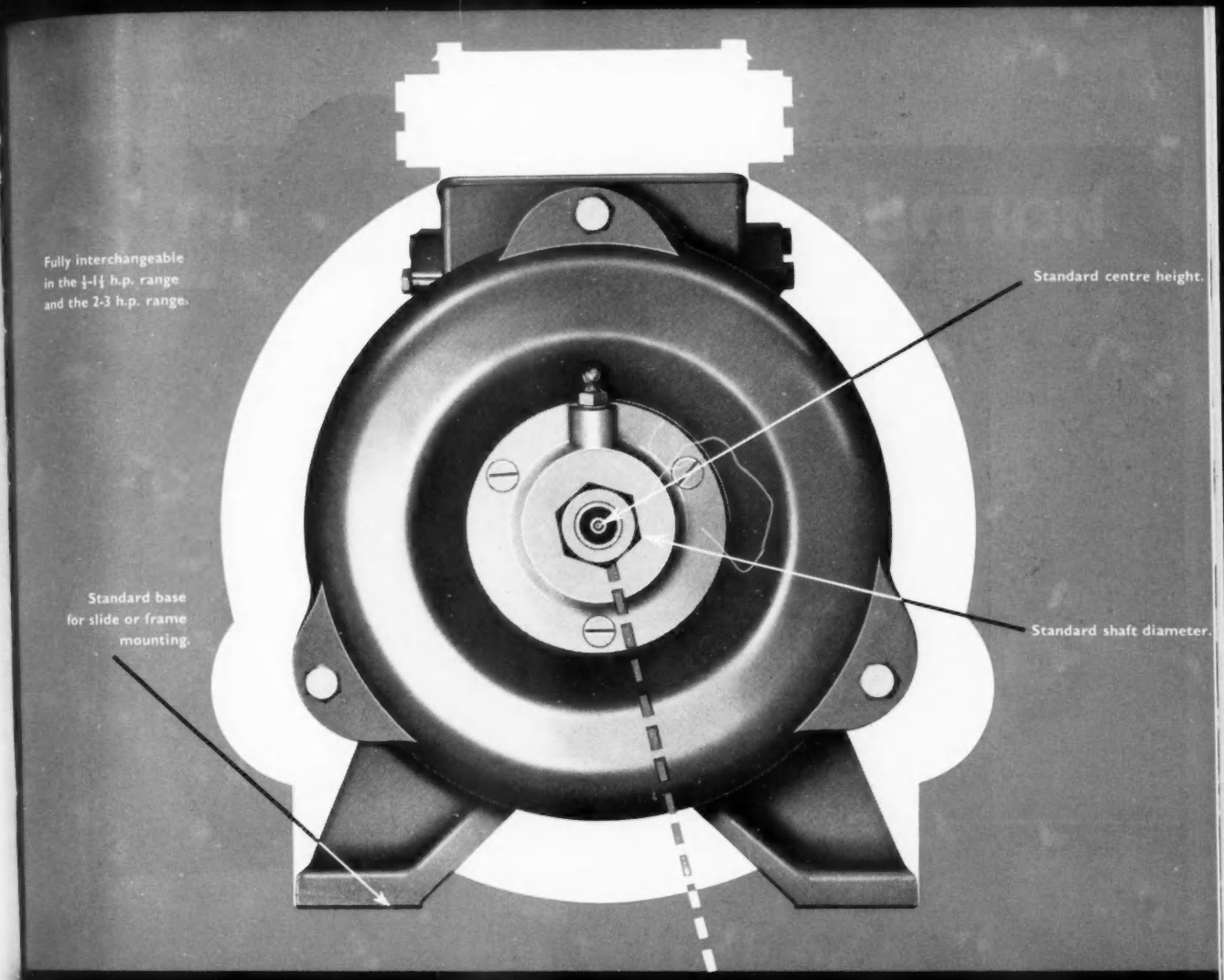
TEXTILE INDUSTRIAL COMPONENTS LTD.,

TICO WORKS, Union Road, Low Moor, BRADFORD

Phone : Low Moor 78565.

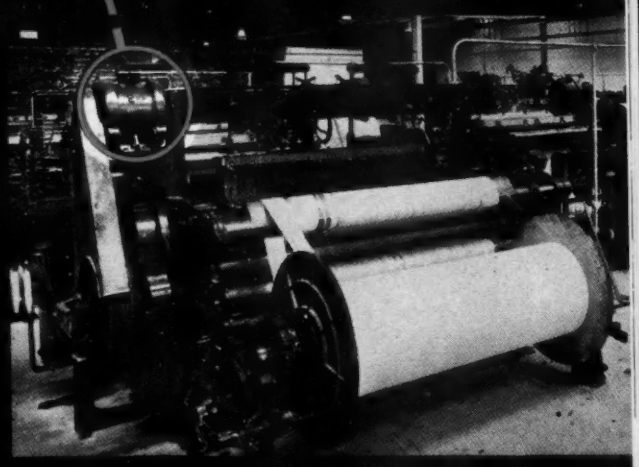
We gladly offer expert technical advice on the practical application of TICO products. To enable us to do this, continual research is undertaken to keep abreast of technical developments in the textile trade.

* *These photographs are exhibited by courtesy of Ormerod Brothers Limited, Brighouse, with whom yarn quality is a primary consideration.*


Fully interchangeable in the ½–1½ h.p. range and the 2-3 h.p. range.
Standard centre height.
Standard base for slide or frame mounting.
Standard shaft diameter.

G.E.C. interchangeable loom motors

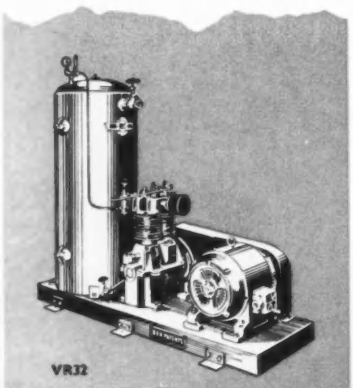
G.E.C. Loom motors seldom demand a moment's attention. Designed to develop a high starting torque, they ensure a correct first pick and beat up. To withstand the severe cyclical variations in speed and load imposed by the looms, the motors have to be as tough as indeed they are. Available from stock, G.E.C. motors are renowned for reliability, the quality which counts most. For full details write for Technical Description No. 347.



G.E.C. textile electrification

THE GENERAL ELECTRIC CO. LTD., MAGNET HOUSE, KINGSWAY, LONDON, W.C.2.

Not so dusty . . .



Powerful, safe and clean, compressed air is ideal for dusting down machinery, hence the increasing use being made in the textile industry of B.E.N. Air Compressors and Blow Guns. Full use of Instantair Couplings in the air line ensures complete flexibility and enables Air Blow Guns to be immediately available for every frame or loom. Air Compressors—portable and stationary—from 2 c.f.m. upwards.

BEN
the symbol of quality

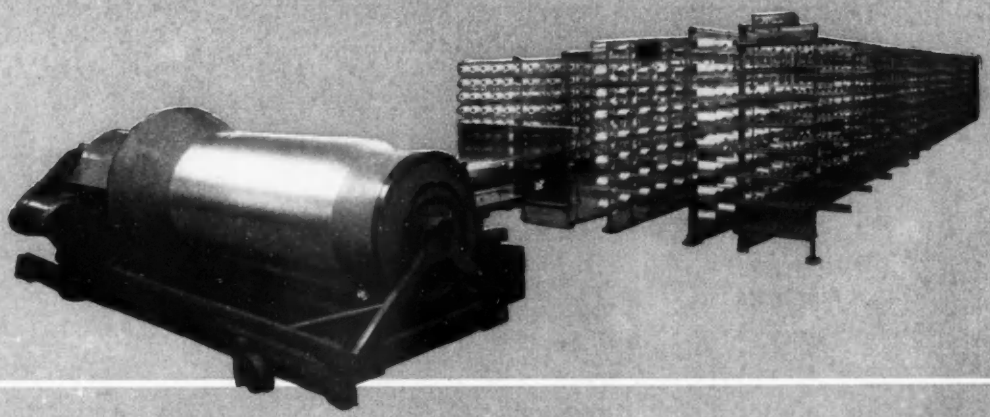
Full details on request, or our representative will be pleased to visit you to give expert advice.

B.E.N. PATENTS LIMITED (Division of Broom & Wade Ltd.) **Dept. UI.**
HIGH WYCOMBE · BUCKS Telephone: **HIGH WYCOMBE 1630 (10 lines)**

CP 317

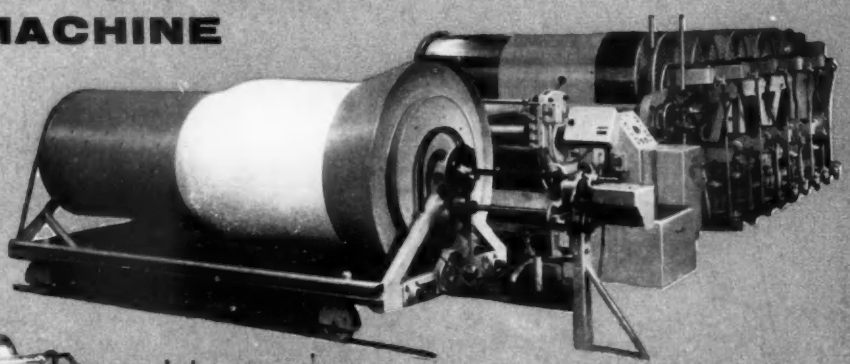
THE LARGEST PRODUCTION
of top quality warps *obtained by :*

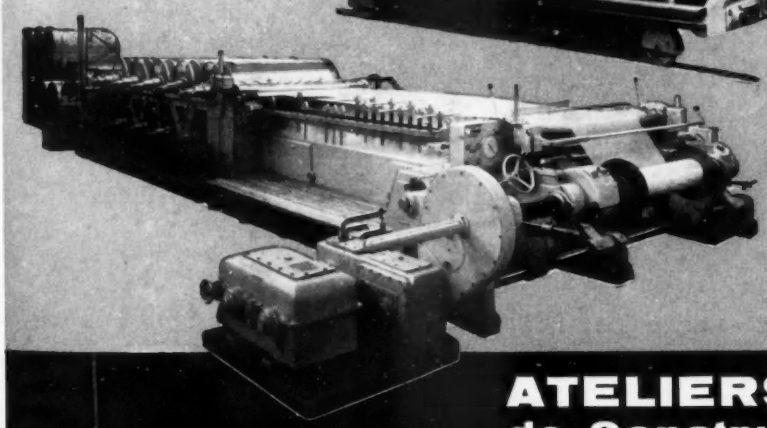
CR. CREELS *(truck and magazine)* **for overend-feed**
OR. WARPER with transportable drum



Multi-cylinders, highly versatile
SIZING-MACHINE

fed from drums...





...or from primary beams

ATELIERS ROANNAIS
de Constructions Textiles
ROANNE - Loire - FRANCE

Phone : 45-81 - Cable : CONSTRUCTILES

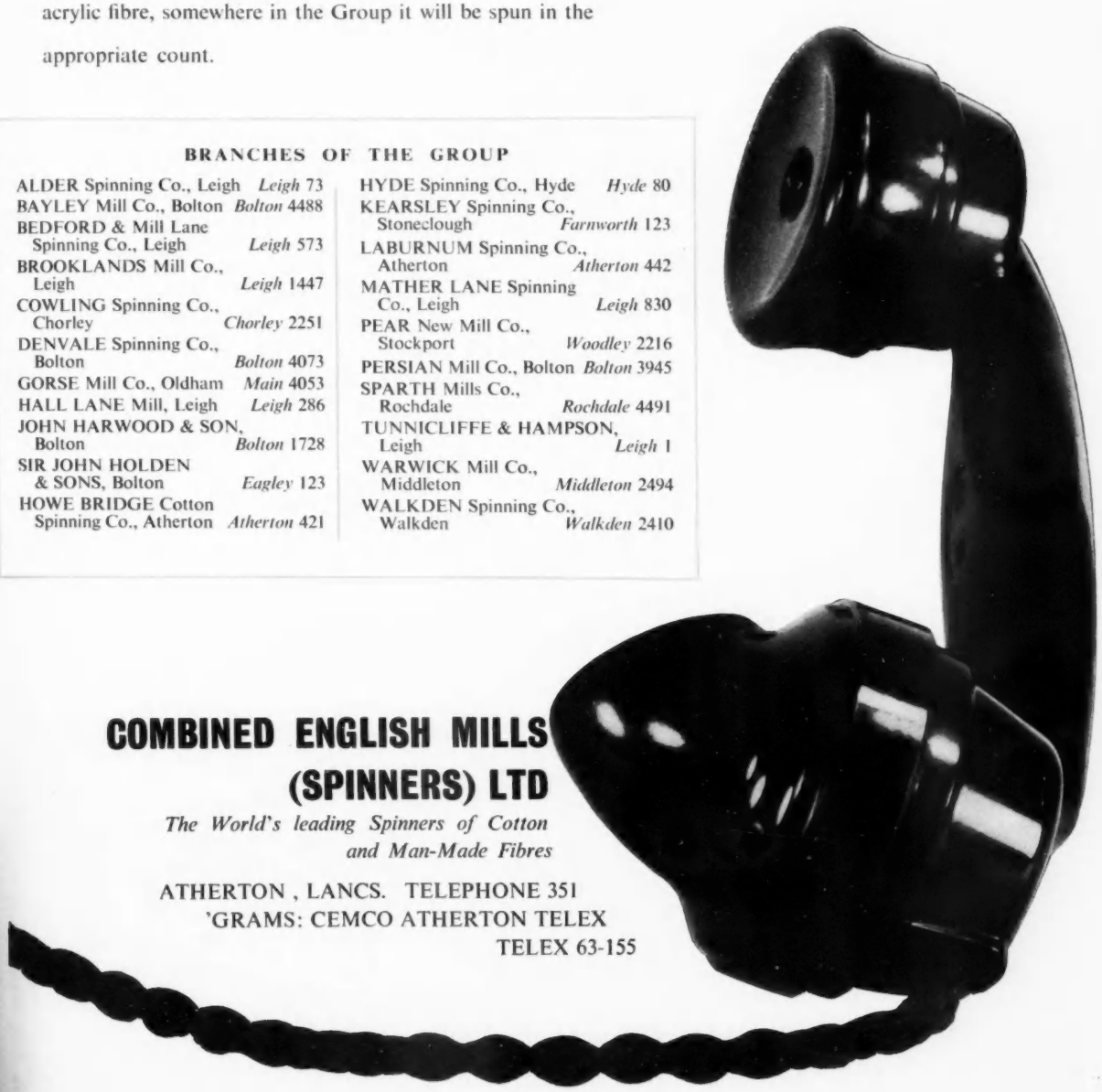
At least *one* of the

35 CEM mills will answer your call

If the yarn you require can be spun on the cotton system, at least one of the 35 mills of Combined English Mills (Spinners) Limited can offer it to you. Whether it be a yarn of cotton, viscose rayon, acetate, nylon, polyester or acrylic fibre, somewhere in the Group it will be spun in the appropriate count.

BRANCHES OF THE GROUP

ALDER Spinning Co., Leigh *Leigh* 73
BAYLEY Mill Co., Bolton *Bolton* 4488
BEDFORD & Mill Lane Spinning Co., Leigh *Leigh* 573
BROOKLANDS Mill Co., Leigh *Leigh* 1447
COWLING Spinning Co., Chorley *Chorley* 2251
DENVALE Spinning Co., Bolton *Bolton* 4073
GORSE Mill Co., Oldham *Main* 4053
HALL LANE Mill, Leigh *Leigh* 286
JOHN HARWOOD & SON, Bolton *Bolton* 1728
SIR JOHN HOLDEN & SONS, Bolton *Eagley* 123
HOWE BRIDGE Cotton Spinning Co., Atherton *Atherton* 421
HYDE Spinning Co., Hyde *Hyde* 80
KEARSLEY Spinning Co., Stoneclough *Farnworth* 123
LABURNUM Spinning Co., Atherton *Atherton* 442
MATHER LANE Spinning Co., Leigh *Leigh* 830
PEAR New Mill Co., Stockport *Woodley* 2216
PERSIAN Mill Co., Bolton *Bolton* 3945
SPARTH Mills Co., Rochdale *Rochdale* 4491
TUNNICLIFFE & HAMPSON, Leigh *Leigh* 1
WARWICK Mill Co., Middleton *Middleton* 2494
WALKDEN Spinning Co., Walkden *Walkden* 2410



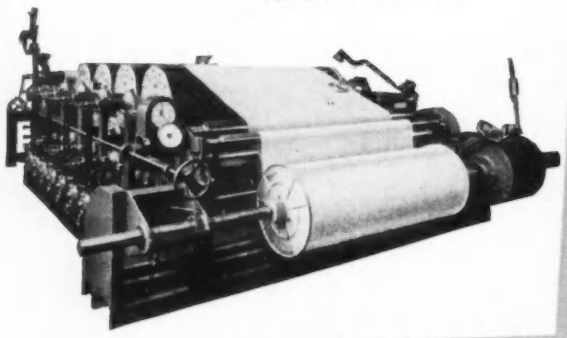
COMBINED ENGLISH MILLS (SPINNERS) LTD

The World's leading Spinners of Cotton and Man-Made Fibres

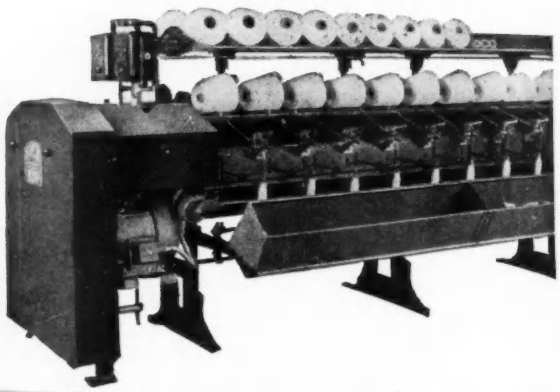
ATHERTON, LANCS. TELEPHONE 351
'GRAMS: CEMCO ATHERTON TELEX
TELEX 63-155

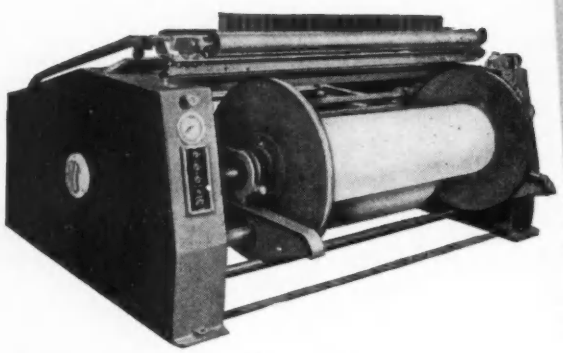
Increased Production...

All yarns Multi-Cylinder Warp Sizing Machine. Suitable for all yarns, including acetate and viscose rayon, nylon and "Terylene"; also rayon, staple, linen, flax, jute and cotton.

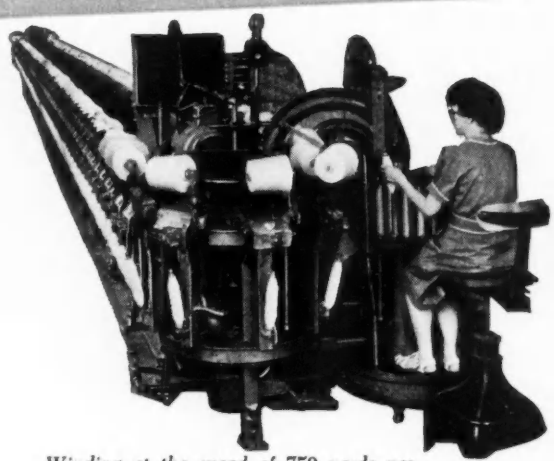


Model 'M86' High Speed Cone or Cheese Winding Machine for perfect packages. Deals alike with all spun yarns in any count or quality.





No. 7 High Speed Beam Warping Machine. Capable of warping speeds up to 1,000 yards per minute. Infinite variable speed, hydraulic beam pressure control, hydraulic beam doffing, ultra-rapid braking system, and simple duplicate controls.



Winding at the speed of 750 yards per minute, the Model 'U' Automatic Travelling Spindle Cone and Cheese Winding Machine increases operative production by 300 per cent.

LOWER OPERATIVE COSTS

WITH HOLT

In addition to the machines illustrated above, the Holt range also includes machinery for High Speed Automatic Pirn Winding (Model 'AP'), High Speed Cheese Winding (Model 'K'), Magazine and Single End Type Creels, Automatic Leasing, High Speed Cross Balling, Nylon Thread Gumming, 378-Spindle Pirn Winding and Warp Mercerising. Leaflets describing all these machines are freely available on request.

HIGH SPEED PRECISION TEXTILE MACHINERY

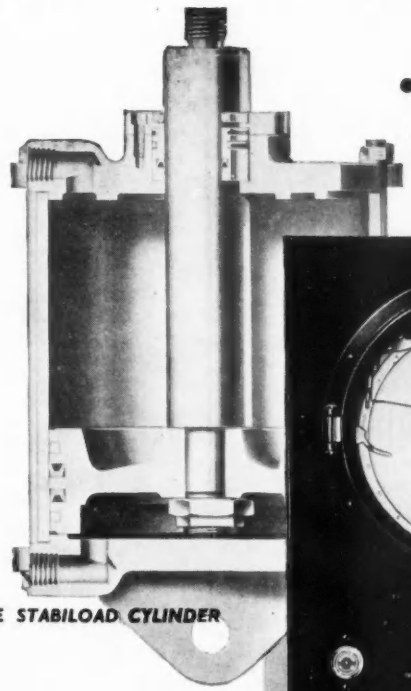
THOMAS HOLT LIMITED - ROCHDALE AND DARWEN

dmHT67

FOXBORO

PNEUMATIC LOADING . . .

. . . for ***padders, washers, mangles, squeeze rolls*** etc

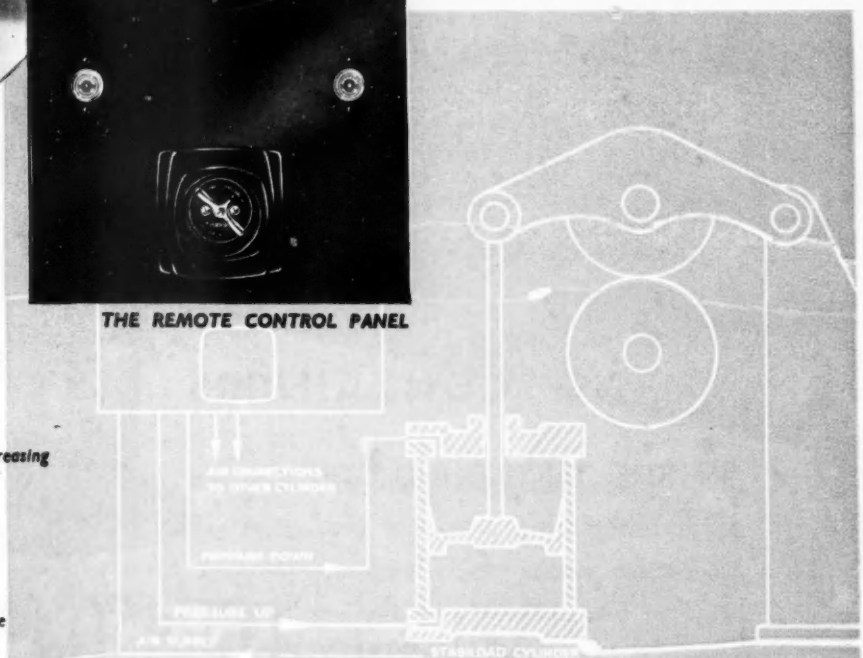


THE STABILOAD CYLINDER

THE REMOTE CONTROL PANEL

ADVANTAGES

1. Increased production
2. Closer uniformity of finished work
3. Remote control
4. Easy, quick and precise adjustment
5. Adjustments while running
6. Instant loading — increasing or decreasing dead weight of roll
7. Instant unloading
8. Prolonged roll covering life
9. Easy installation: Easy maintenance



FOXBORO-YOXALL LIMITED

REDHILL, SURREY. **Tel.: Redhill 5000**

British Craftsmanship IS ON TOP!

SPECIFY Castle FIBRE

FOR YOUR

CANS AND CONTAINERS

IN THE TEXTILE INDUSTRY

LIGHT WEIGHT

TOUGH

QUIET

DURABLE

HIGH QUALITY

Vulcanised Fibre Ltd

GUILDFORD AND EYNSFORD

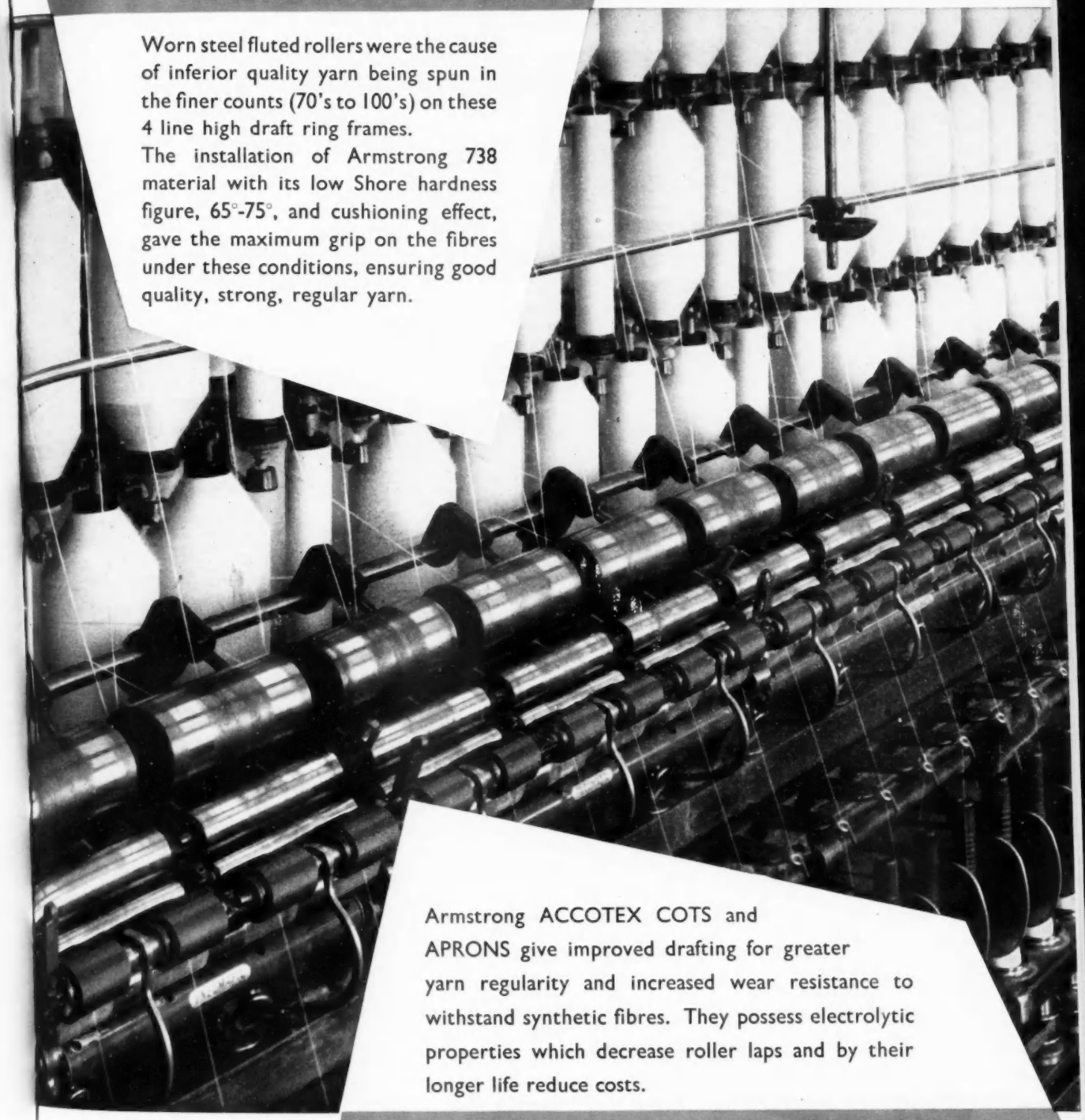
MANCHESTER OFFICE:
ROYAL BUILDINGS,
2, MOSLEY STREET

Telephones:
GUILDFORD
Guildford 5214 (4 lines)
MANCHESTER
Central 5947

MAKERS OF FINE MATERIALS

MILL MODERNIZATION
Case History No 2

Worn steel fluted rollers were the cause of inferior quality yarn being spun in the finer counts (70's to 100's) on these 4 line high draft ring frames.
The installation of Armstrong 738 material with its low Shore hardness figure, 65°-75°, and cushioning effect, gave the maximum grip on the fibres under these conditions, ensuring good quality, strong, regular yarn.



Armstrong ACCOTEX COTS and APRONS give improved drafting for greater yarn regularity and increased wear resistance to withstand synthetic fibres. They possess electrolytic properties which decrease roller laps and by their longer life reduce costs.

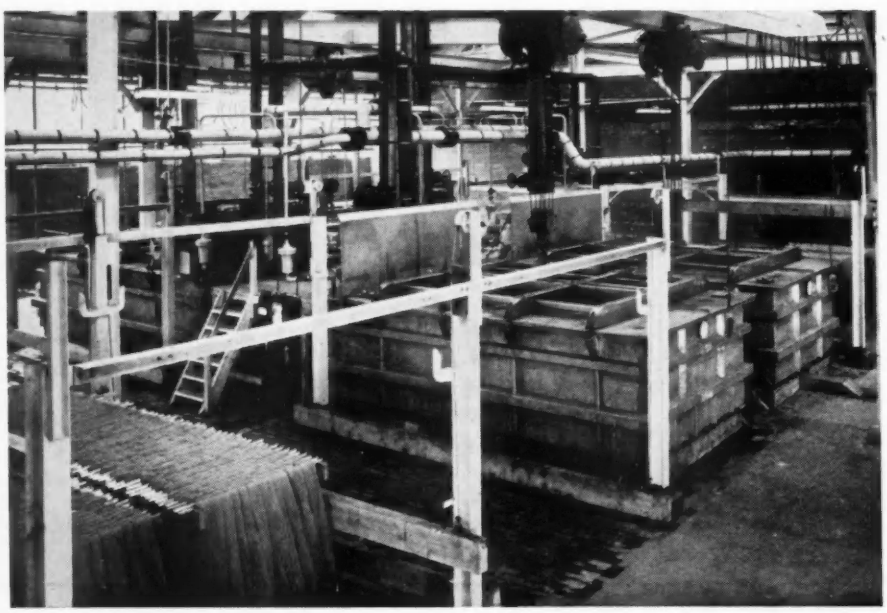
Armstrong ACCOTEX* COTS & APRONS

* *Registered trademark (Armstrong Cork Company - Registered Users).*

For full details write to:
ARMSTRONG CORK COMPANY LTD., 210-213 ROYAL EXCHANGE, MANCHESTER 2.
And at Peckover Street, Bradford, and Kemback Street, Dundee.
Telephone: Deansgate 7311/2 and 8078.
Regd. Office: Kingsbury, London, N.W.9.
Factories: OLDHAM and GATESHEAD-ON-TYNE.

LONGCLOSE LEAD THE FIELD

The World's largest Dyeing Machine, having a capacity of 9,000 lbs. of carpet yarn.



Not only do we specialise in large capacity stainless steel hank dyeing machines but also in stainless steel dyeing and bleaching machines for all types and forms of textiles.

Whatever your needs, the experience we have gained over the past 45 years is at your disposal.

WRITE FOR FURTHER DETAILS TO

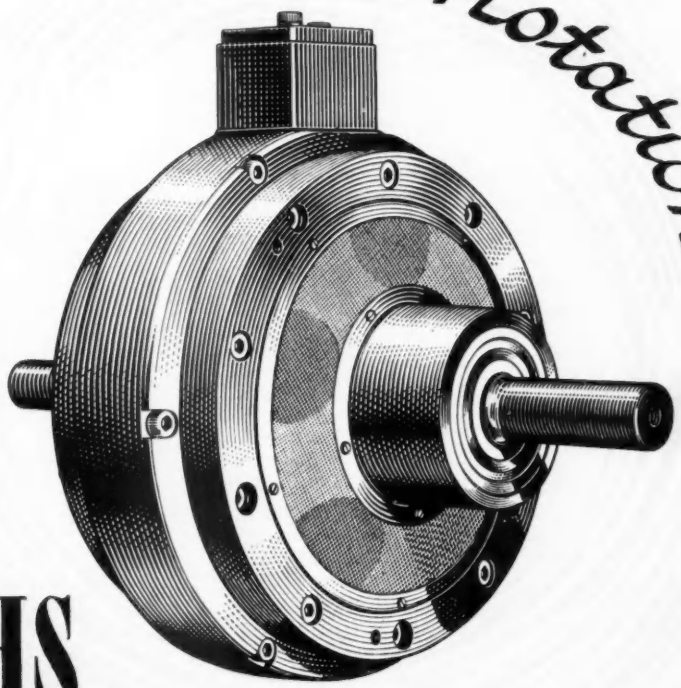
LONGCLOSE ENGINEERING Co LTD

Please note, our new address is

Crescent Works, Dewsbury Road,
LEEDS 11

Telephone : 77261

Revolution in Rotation



SMITHS *Magnetic Particle* COUPLING

which combines:—**the resilience of the hydraulic coupling and the positiveness of the frictional coupling.** It is revolutionary in that driving and driven elements are coupled by magnetically-activated particles. It has these advantages:—

Accurate torque control
No mechanical engagement and thus negligible wear
Accurate torque limiting slip on overload
Acts as brake or coupling in **either** direction

Perfectly smooth operation
No slip rings—excitation coil is stationary
Remote control at any distance
Dynamic and static coefficients of friction equal

The range comprises eight standard units with torque capacities from ½ to 200 lb/ft.

SMITHS Magnetic Particle COUPLING is unique, its potentialities enormous. Let us advise you, therefore, how best to use it in your particular field.

SMITHS **S. SMITH & SONS (ENGLAND) LTD.**

INDUSTRIAL PRODUCTS DEPARTMENT, WITNEY, OXON.

new lap resistant cot...
drafting advantages

All Weather Dayco EW 661 Cot draws uniformly, despite extreme "dog day" heat and humidity.

Completely new EVERGREEN compounds give you these vital features:

1. Improved drawing of *all* fibers—especially synthetics
2. Stays dry—won't sweat
3. Never becomes sticky
4. Won't adhere to fibers during shutdowns

Amazing surface action of newly developed EVERGREEN compounds assure you practically lap-free spinning every day of the year. This NEW DAYCO Cot has proved itself lap resistant in *any weather* in actual mill tests. It never sweats nor becomes sticky, so the yarn can't slip nor adhere to the surface.

Even on mid-summer "dog-days" with heat and humidity zooming upward, the EVERGREEN compounds in the new DAYCO EW661 Cot run cool, draw yarn smoothly, evenly, virtually *without lap-ups*!

Your DAYCO Representative will be in to see you soon. He'll be glad to arrange for you to run a test frame of the all new DAYCO AP664 Aprons and the new all-weather DAYCO EW661 Cots as well as give you additional facts on these new, improved DAYCO *products*.

THE DAYTON RUBBER CO. LTD., LANCASHIRE SALES DIVISION
Sheffield Street, Heaton Norris, Stockport
Tel.: Stockport 3464

Manufactured by THE Dayton Rubber CO. LTD.

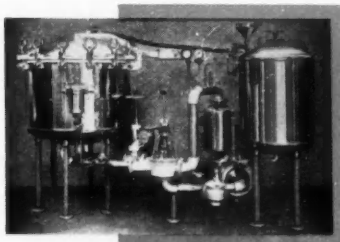
DAYTON WORKS - DUNDEE - SCOTLAND

DAYCO AND THOROBRED TEXTILE PRODUCTS FOR BETTER SPINNING AND WEAVING

PEGG

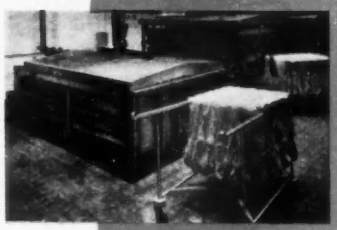
PRESSURE DYEING MACHINES

A complete range of machines for dyeing all types of fibre in every stage of manufacture, including loose, top, beam, hank and package forms. Also rapid package drying machines.



HANK DYEING MACHINES

Built in stainless steel in capacities ranging from 25 to 1500 lbs. for all classes of wool, worsted, mixture and linen yarns in hank form. Machines may be coupled together.

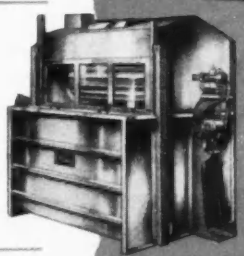


LOOSE STOCK DYEING MACHINES

For all classes of loose stock, rags and synthetic fibres, in 3 capacities of 10–50 lbs., 100–250 lbs. and 200–600 lbs. Stainless steel construction.

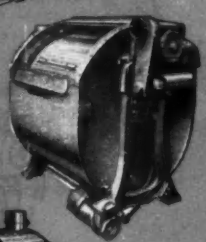
PIECE GOODS DYEING MACHINES

A comprehensive range of machines available in stainless steel for dyeing all types of woollen or worsted piece goods, silk or rayon fabrics and knitted fabrics in rope form. Also carpet dyeing machines.



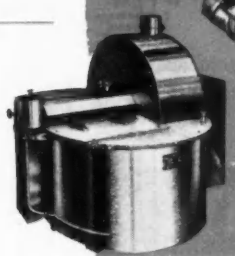
ROTARY DYEING MACHINES

Totally enclosed rotating drum machine for dyeing nylon, pure silk, rayon and cotton hose with perfect penetration and uniformity. Stainless steel in 25, 50, 100, and 200 lbs. capacities.



PADDLE DYEING MACHINES

A versatile machine, in stainless steel, for ladies' hose, half hose, and loose articles. Also used for anti-shrink and bleaching. 4 capacities from 12–200 lbs.



DYEING AND FINISHING MACHINES

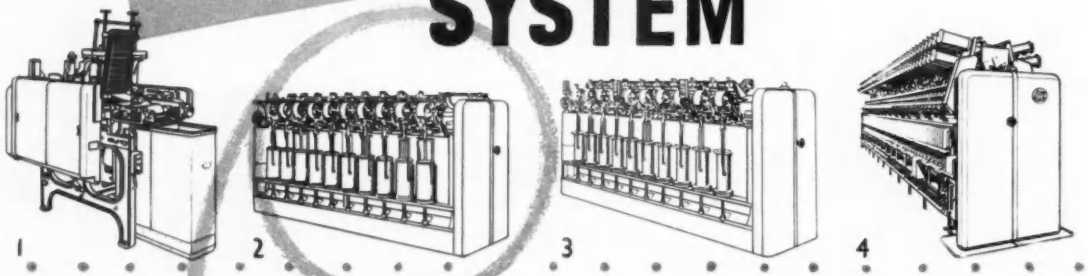
Builders of dyeing machines for loose stock, hanks, packages, piece-goods, fabric and hose; also finishing machines for all classes of circular knitted and warp loom fabrics and garments. Pre-boarding and finishing machines for nylon hose.

A Member of the Bentley Group

SAMUEL PEGG & SON LTD · **Barkby Rd** · **Leicester** · **England** Telephone: 66651 · Telegrams: 'PULSATOR'

S.P.1

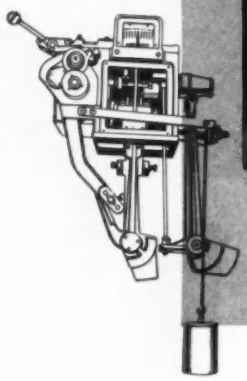
the NEW BRADFORD SYSTEM

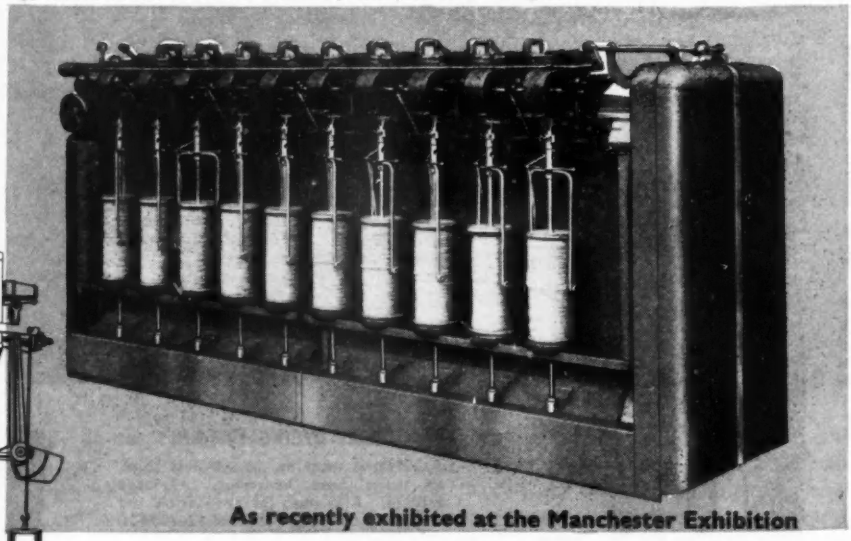


featuring the *RAPER AUTOLEVELLER DRAW BOX

The New Bradford System is the shortest and most flexible method of worsted drawing and spinning in existence for production of quality yarns at competitive cost. There are only 3 operations of drawing attended by 2 operatives for production of 100-120 lb/hour. All counts of yarn are spun from a standard weight of roving on the Megaflex/Ambler Superdraft ring spinning frame. 2nd operation: The Raper Autoleveller spindle draw box, model K.R.D.1. for the final correction of the sliver weight. One Autoleveller Unit for each sliver combined with the patent pressure drafting device.

The drawing is of the Raper Autoleveller Unit on the Drawbox, showing measuring rollers and relay mechanism. The photograph shows a general view of the Autoleveller Drawbox.





As recently exhibited at the Manchester Exhibition

* OVER 6,000 UNITS ARE NOW AT WORK IN 36 DIFFERENT COUNTRIES

PRINCE-SMITH & STELLS LTD.

INCORPORATING TAYLOR WORDSWORTH & CO. LTD.

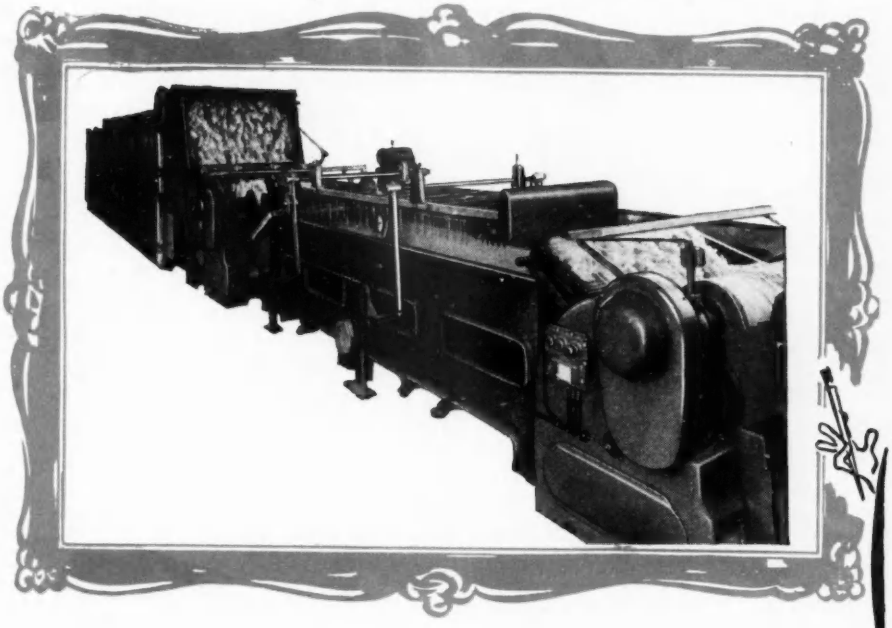
KEIGHLEY · YORKSHIRE · ENGLAND

PSS 75

A Masterpiece

IN WOOL WASHING MACHINERY

by Taylor Wordsworth



Part of a set of modern Leviathan type Washbowls with Model 55 pneumatic Squeezing Heads followed by Aireflow Drying Machine. This set of machines recently installed in a modern Woolcombing mill.

Leviathan type Washbowls are made in all widths up to 6-ft. wide and have side operated rake motion with settling tank underneath main bowl. The overall width of the Leviathan type machine is considerably less than alternative forms of construction.

Self-cleaning Washbowls can be offered with side operated rake motion and many other unique exclusive features.

We also make Washbowls with side settling tanks and overhead rake motions, self-cleaning or ordinary type. The Model 55 Squeezing Head can have individual hydraulic pressure or have pressure applied pneumatically.

TAYLOR WORDSWORTH & CO LTD

INCORPORATED WITH PRINCE-SMITH & STELLS LTD.

MIDLAND JUNCTION FOUNDRY · LEEDS 11 · ENGLAND

PSS81B

For better and higher drafting

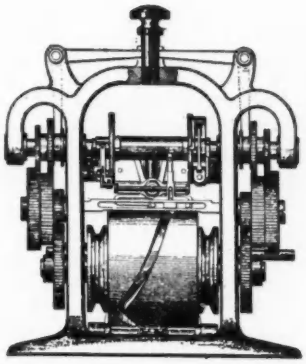
CASABLANCAS

GX 2

system

INCORPORATING
THE BEST PRINCIPLES—
THE NEWEST IDEAS

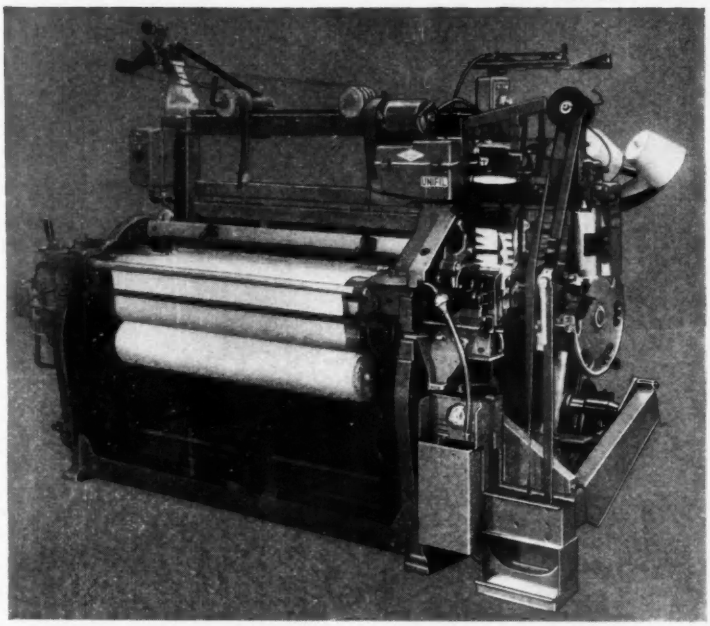
CASABLANCAS HIGH DRAFT COMPANY LIMITED
BOLTON STREET, SALFORD 3 · Telephone DEAnsgate 2335



The Original
Precision Winding Machine

ORIGINATORS IN 1891

STILL LEADING IN 1958



LEESONA Regd. T.M.

UNIFIL

LOOM WINDER

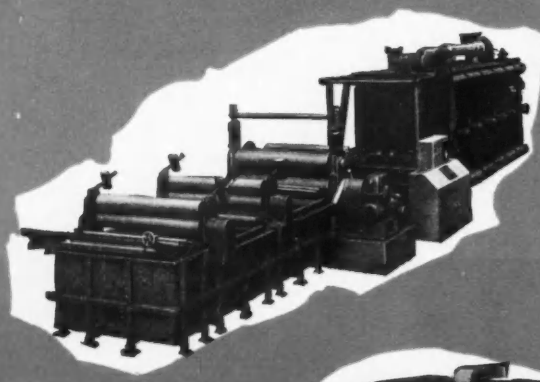
A new conception of weft preparation for automatic loom weaving

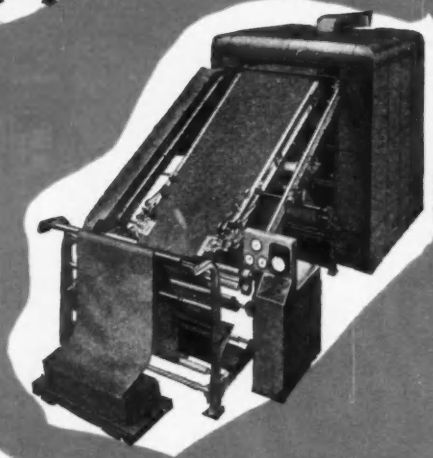
UNIVERSAL WINDING COMPANY

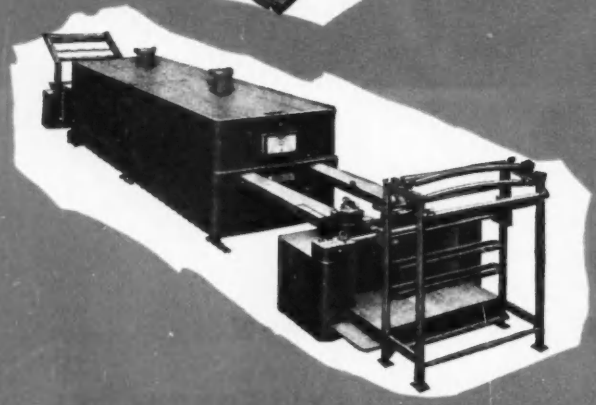
SAVILLE STREET, OXFORD ROAD,
MANCHESTER 1. Tel. ARD. 4304

GLASGOW LEICESTER LONDON BRADFORD

Talented Threesome
from Beech Works







From the range of textile finishing machinery manufactured at Beech Works we bring this talented trio into the limelight. The **E.G.W. Carboniser** (top illustration) incorporates the latest Open Width Acidizer with automatic acid strength control, and 3-stage Drying and Baking Unit. A completely synchronised plant, with comprehensive control panel for one-man operation.

The now well known **Mark III E.G.W. Velocitair Tentering Machine** (centre) is a multi-layer machine employing nozzle drying, which occupies extremely small floor space, and is suitable for all types of fabrics, from lightweight materials to heavy overcoatings, and even Mohair rugs.

The bottom illustration shows one of the more recent additions to the E.G.W. Range— the famous **E.G.W.-Vits Universal Stenter,** now manufactured under licence at Beech Works. This phenomenal machine incorporates the Vits World Record Drying System for the quick drying, shrinking or setting of fabrics, or for polymerising and processing of resin finishes.

FOR FURTHER DETAILS OF THESE MACHINES PLEASE WRITE TO OUR SALES DEPT.

E. GORDON WHITELEY
LIMITED

BEECH WORKS · MORLEY · YORKSHIRE

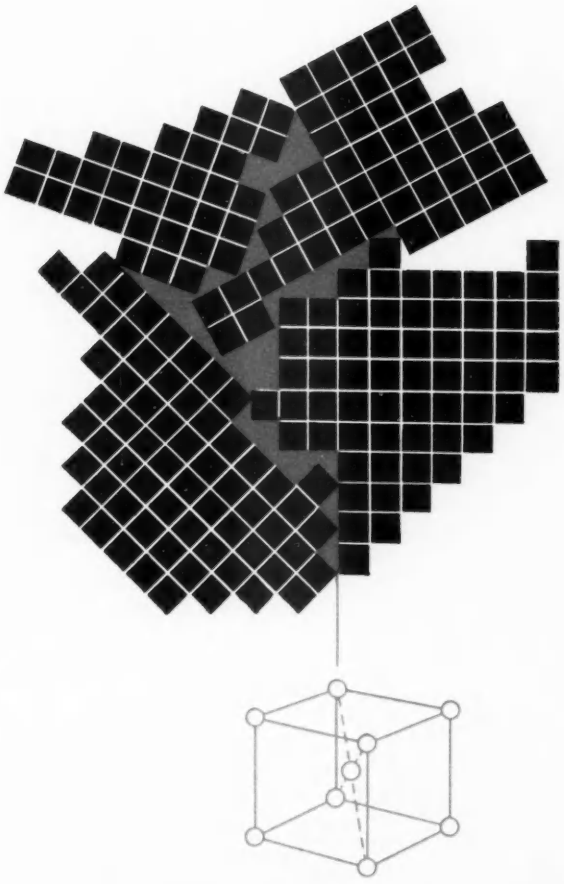
Telephone:
Morley 501 and 923
Telegrams and Cables:
Tentering, Morley

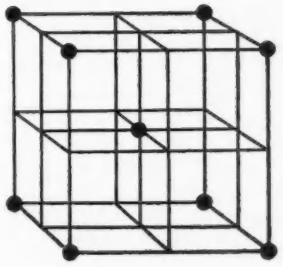
GRAIN CONTROL

Seen under a microscope, BRYMILL tested steel (A) shows a greater area of Atomic Disarray than do many of the coarser grades (B).

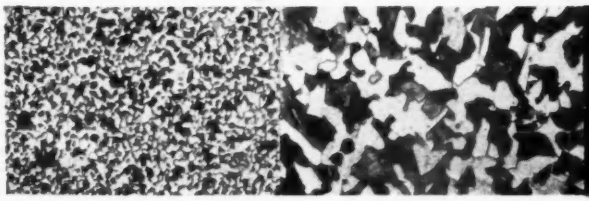
This difference is due to the technique of 'Grain Control' which ensures a tougher product, possessing lower internal stress and capable of withstanding rigorous uses in all conditions.

BRYMILL Laboratories will be happy to advise on the grades of steel most suited to your particular need.





a b

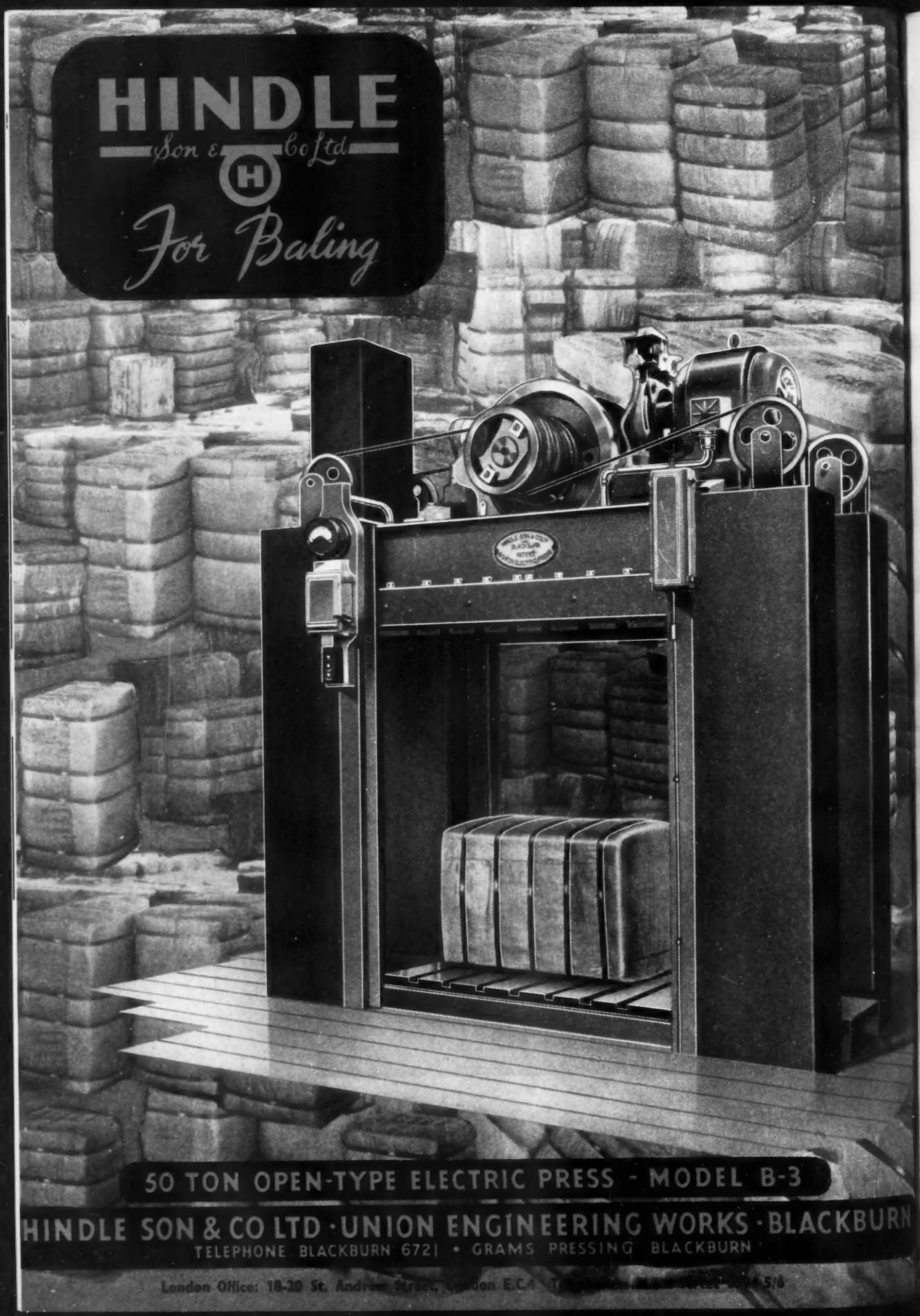


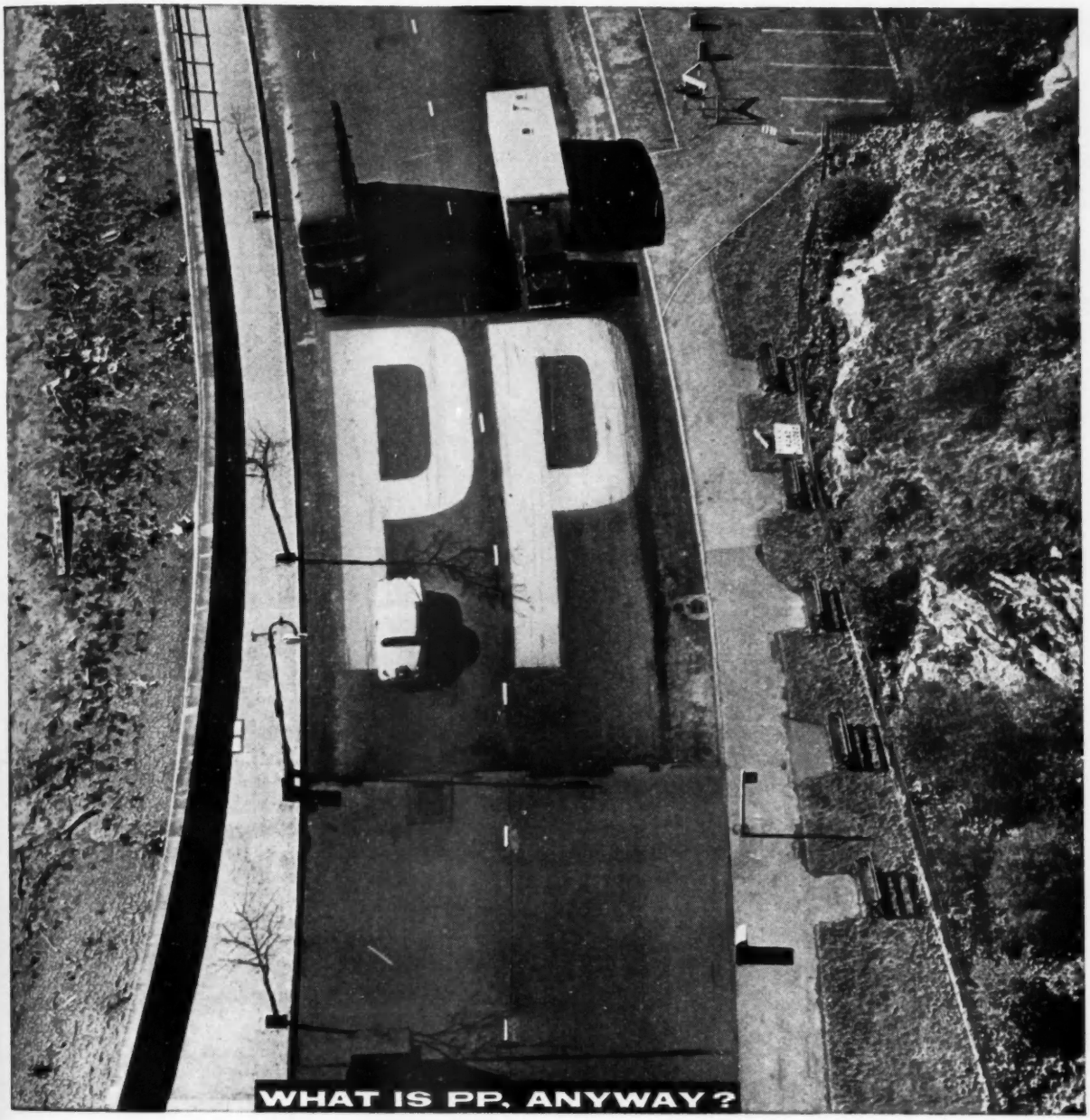
BRYMILL

TESTED STEELS

BRIGHT DRAWN · CENTRELESS TURNED
BRIGHT HEAT TREATED BARS

BRITISH ROLLING MILLS LTD · BRYMILL STEEL WORKS · TIPTON STAFFS


HINDLE
Son & Co Ltd
H
For Baling
50 TON OPEN-TYPE ELECTRIC PRESS - MODEL B-3
HINDLE SON & CO LTD · UNION ENGINEERING WORKS · BLACKBURN
TELEPHONE BLACKBURN 6721 • GRAMS PRESSING BLACKBURN
London Office: 18-20 St. Andrew Street, London E.C.4



You come across it wherever you go—Progressive Packaging indicating the short route to soaring sales. Your packaging *must* be progressive—the best and most suitable of transparent materials, the most brilliant printing techniques, and ideas which are way out ahead.

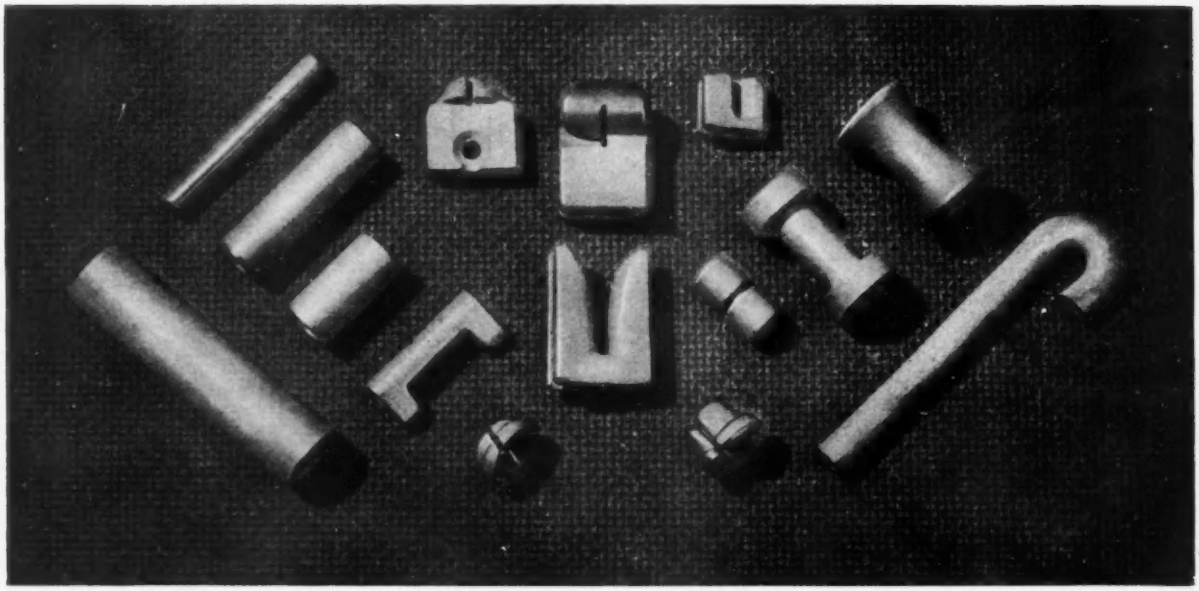
For *your* PP **... call in**

Colodense

COLODENSE LTD · WEST STREET · BRISTOL 3 · TEL: 63015

"FARADEX"

Thread Guides Conducting and non-Conducting. Recommended by Imperial Chemical Industries Ltd., manufacturers of "Terylene" Polyester Fibre.



Sole Agents: **Northern Mill Supply Co.**

EAST DIDSBURY STATION · · MANCHESTER 20

Phone : DIDsbury 4272 **Grams : Ceramics, M/cr. 20**

★ NEPRO ★

LIQUID NEOPRENE COATINGS

for Durable Protection

anti-corrosive • anti-abrasive • weatherproof • flexible

manufactured in two grades ——— **N·700** ——— **N·200** ———

by

PRODORITE LTD

Head Office:

EAGLE WORKS

WEDNESBURY

Telephone: WED 1821 (9 lines)

A permanently flexible coating for simple application to metal and wood structures for corrosive fume and splash protection.

•

A resilient heavy duty lining for application to metal, and wood for permanent protection of fans, ducting, pipes, tanks, chemical and marine plant.

•

write now for full information on Nepro Protective Coatings

Sole licensees in the U.K. for Gates Engineering Co., U.S.A. Gaco Processes

WITHSTANDS HIGH PRESSURE

they are · RIGHT in Oilite

WEAR RESISTING

SHOCK RESISTING

The accuracy of the finished dimensions of self-lubricating Oilite bearings and structural parts is maintained to close limits. They are precision manufactured in large quantities by the powder metal process which effects considerable economies by eliminating intricate machining operations. Made in Bronze, Brass and Ferrous Alloys. Wear and shock resistance is high due to the inherent self-lubricating properties and pressures up to 15,000 p.s.i. and higher are permissible with certain Oilite alloys.

Oilite

SELF-LUBRICATING BEARINGS AND POWDER METAL PARTS

THE MANGANESE BRONZE & BRASS CO LTD *Elton Park Works Hadleigh Rd Ipswich · Grams: Oilite Ipswich · Tel: Ipswich 55926*

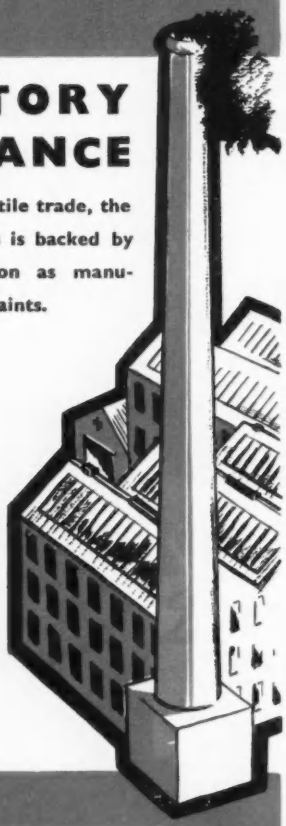
P2267

PAINT

FOR FACTORY MAINTENANCE

Famous throughout the textile trade, the name of Wareing Brothers is backed by over fifty years' reputation as manufacturers of high-quality paints.

WALL PRIMERS
WATER PAINTS
FLAT OIL PAINTS
GLOSS PAINTS
AND ENAMELS

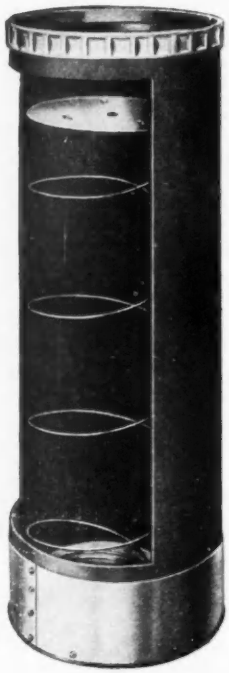


at sensible prices

WAREING BROS. & COMPANY LIMITED
CARLTON STREET WORKS, BOLTON, LANCS.
Tel. BOLTON 1566 (3 lines)

CW 4031

S.W.C.
STOWACA (REGD.) BRAND



LARGE DIAMETER CANS

PATENT SPRING GRIP TOP RINGS

are solid drawn Siemen's Steel, no rivets or swageing required. Made solely by us in 9 in., 10 in., 11 in., 12 in. and 14 in. diameter.

FOR STAPLE FIBRE SPINNERS

MORE AND MORE MILLS look to "Stowaca" products because of lightness and durability. Manufacturers also of tinned steel, planished steel card cans, boxes, trucks, etc.

The Fibre Can illustrated above has been cut away to show the Spiral Spring.

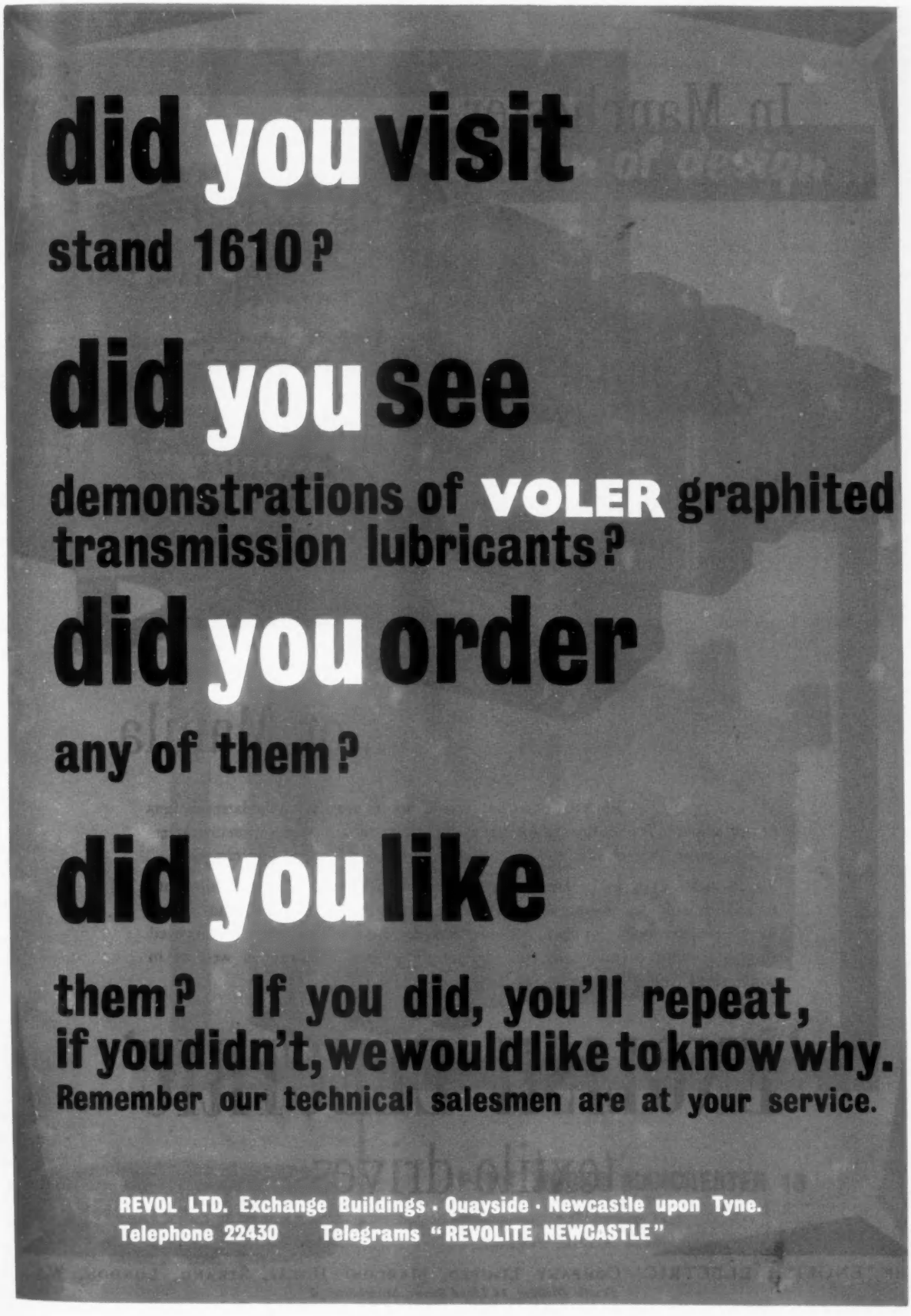
BEST QUALITY HARD GENUINE VULCANISED FIBRE CARD CANS WITH PATENT "SPRING GRIP TOP RINGS"

We are the actual makers of CARD CANS, BOXES, TRUCKS, SPIRAL SPRINGS, etc., have the most modern machinery in the trade, and a staff of highly skilled workmen. Some of our men have been in the trade forty years and are masters of their craft.

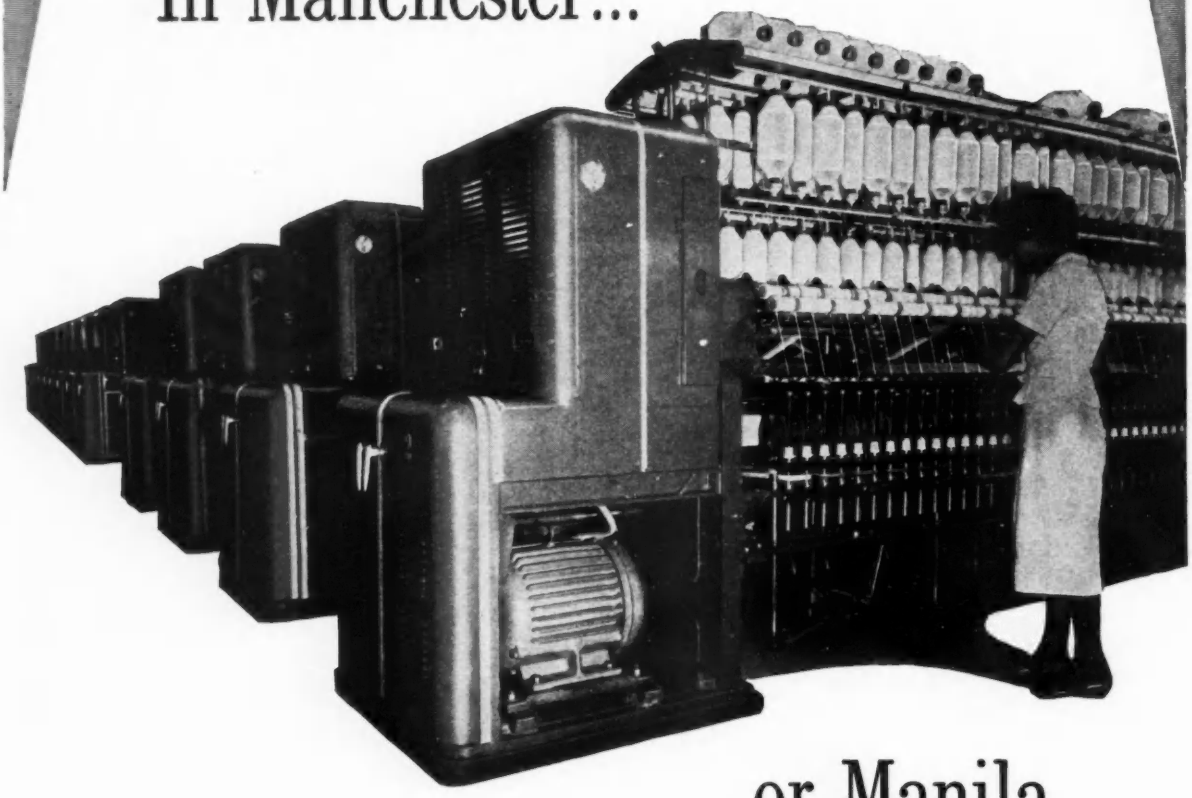
THE OLDEST CAN MAKERS IN GREAT BRITAIN

STOWACA FIBRE & CAN CO. LTD.
MOSTON · MANCHESTER · ENGLAND

Telegrams: Stowaca, Manchester
Telephone: COLlyhurst 2545


did you visit
stand 1610?
did you see
demonstrations of VOLER graphited transmission lubricants?
did you order
any of them?
did you like
them? If you did, you'll repeat,
if you didn't, we would like to know why.
Remember our technical salesmen are at your service.
REVOL LTD. Exchange Buildings · Quayside · Newcastle upon Tyne.
Telephone 22430 Telegrams "REVOLITE NEWCASTLE"

In Manchester...



...or Manila

'ENGLISH ELECTRIC' textile motors are driving the latest designs of ring spinning frames throughout the world. Their smooth acceleration characteristic improves yarn quality and reduces the end breakage rate to a minimum.

The 'ENGLISH ELECTRIC' comprehensive system of textile factory electrification with its co-ordinated design embracing substation transformers, switchgear and 'Superform' distribution equipment, driving motors and control gear, has proved successful both economically and technically in new factories as well as in conversions from steam to electric drives.

'ENGLISH ELECTRIC'
textile drives

THE 'ENGLISH ELECTRIC' COMPANY LIMITED, MARCONI HOUSE, STRAND, LONDON, W.C.2

Textile Division, 14 Lloyd Street, Manchester, 2

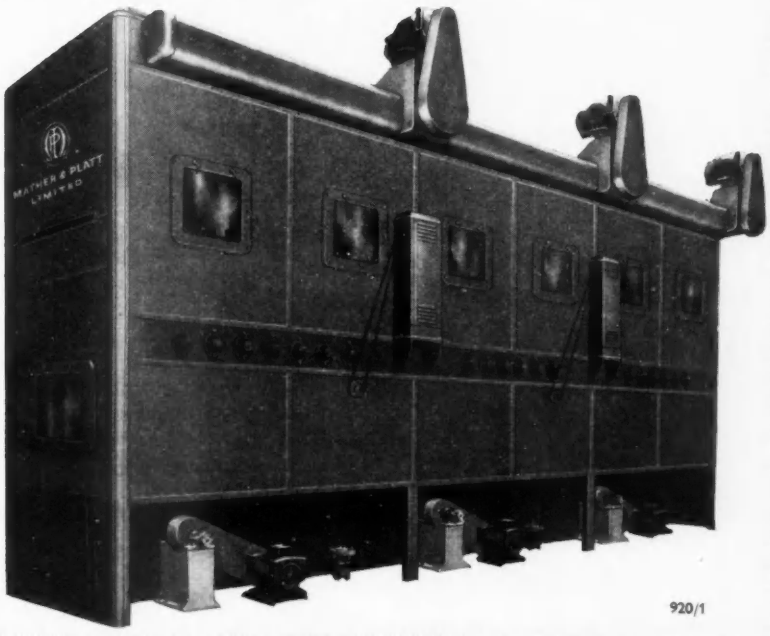
WORKS: STAFFORD · PRESTON · RUGBY · BRADFORD · LIVERPOOL · ACCRINGTON

TX.45

It's a question of design...

Soundly designed textile finishing machinery saves valuable space—the Hot Air Drying Machine illustrated achieves double the output of previous designs occupying the same floor space. Using hot air at controlled temperatures, and with automatic adjustment of cloth tension, this machine is ideal for drying dyed or padded cloth.

We produce a complete range of bleaching, dyeing, printing and finishing machinery. Full particulars available on request.



Mather & Platt
LIMITED

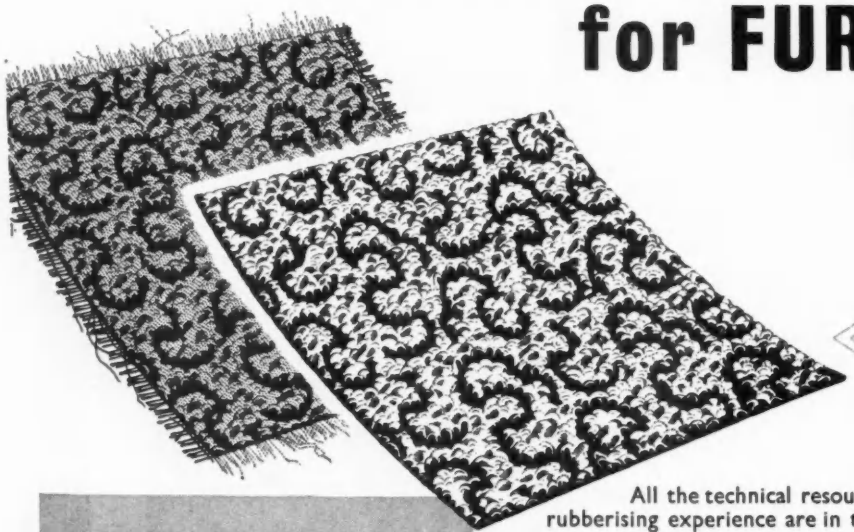
PARK WORKS MANCHESTER 10

Telephone: *COLlyhurst* 2321
Telegrams: *Mather, Manchester*

☆ FABRIC MANUFACTURERS
☆ FURNITURE MAKERS

READ THIS

WITCO introduce a NEW AND BETTER RUBBERISED BACKING for FURNISHING FABRICS



WITCO

All the technical resource and "know how" of years of rubberising experience are in the Witco method — and great, *very great*, are the advantages possessed by fabrics backed the Witco way. That is why U.S. Fabric Manufacturers and furniture makers have for years been Witco enthusiasts.
Happily, the Witco method is now available to fabric manufacturers throughout Britain, and Witco-backed fabrics are already obtainable from firms using the Witco technique.

TRIED, TESTED & ACCLAIMED IN U.S.A. WITCO SYNTHETIC BACKING COMPOUND GIVES

10 OUTSTANDING ADVANTAGES

INCLUDING

- ★ IMPROVED APPEARANCE AT LOWER COST
- ★ Distinctiveness of pattern; dimensional stability
- ★ Produces pile stand up
- ★ Produces a very satisfactory pile bind
- ★ Prevents curling during cutting
- ★ Prevents fraying
- ★ Prevents fabric or seam slippage
- ★ Contributes to a satisfactory fabric handle
- ★ Permits decrease in the number of picks used, so saves fibre costs
- ★ Increases weaving production and efficiency

BETTER TRADE — MORE MONEY

The necessary rubberising plant is not expensive and the cost is quickly recovered by the quite revolutionary advantages, savings and increased orders effected. All technical help and advice regarding Witco Synthetic Backing Compound is offered FREE. So is the experimental use of the Witco Pilot Plant at Droitwich.
To fabric manufacturers we say — please communicate with us. Enquiries will be treated in confidence, and at the highest level.

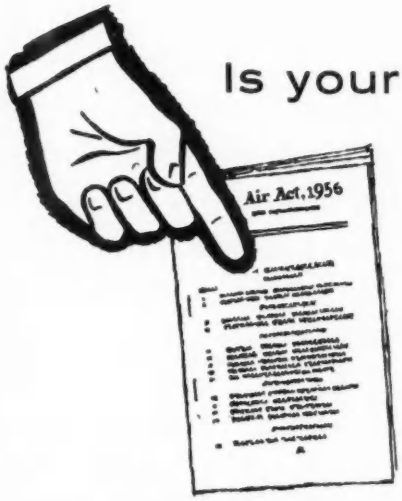
To furniture makers we say — insist on Witco backed fabrics. *They're* the winners.

To both we say — Witco does a better, longer lasting and more acceptable job at lower cost. That way lies vastly better trade and more money. So Enquire NOW.

WITCO CHEMICAL COMPANY, LTD

BUSH HOUSE, ALDWYCH, LONDON, W.C.2 TEM 6473/6
Pearl Assurance House, Princess St., Manchester 2 CEN 9066/8

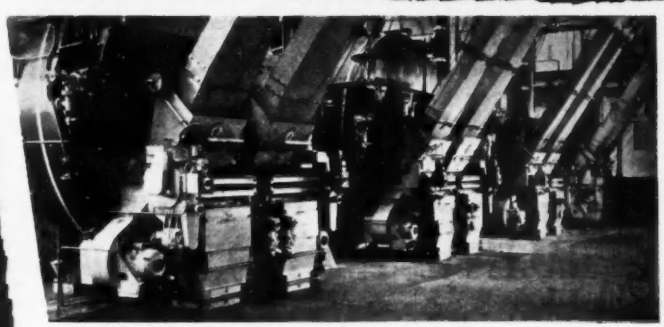
Also at: Droitwich, New York, Chicago, Detroit, Akron, Boston, Cleveland



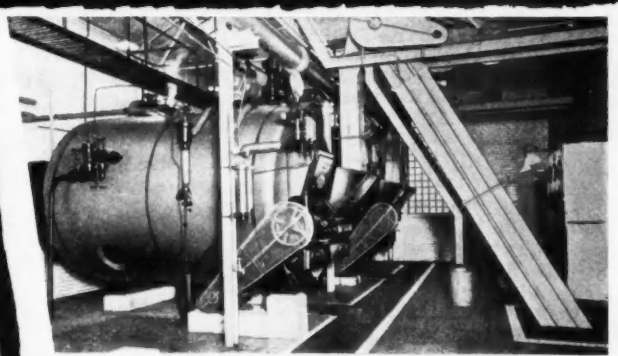
Is your problem smoke prevention?

Clearly BENNIS have the answer –in fact **two** answers!

With the CHAIN GRATE and "LOW RAM" Stokers for the firing of shell type and small water tube boilers Bennis offer two machines which give not only freedom from legislative action but a new economy. For smokeless combustion, higher thermal efficiency and fuel economy with maintenance costs reduced to a minimum, the answer is clearly BENNIS.



Bennis Chain Grate Stokers fitted to Economic boilers.



"Low Ram" Stokers fitted to Ruston & Hornsby Horizontal "Thermax" Economic boilers.

We can also supply Oil Fuel Burners and Auxiliary equipment with complete erection, pipework and storage tanks.

ONE OF THE HODGKINSON GROUP OF COMPANIES

BENNIS
COMBUSTION LIMITED

LITTLE HULTON, WALKDEN, MANCHESTER
Telephone: WALkden 3213/4/5
LONDON OFFICE: Brettenham House, Lancaster Place, Strand, W.C.2.
Telephone: COVent Garden 1512

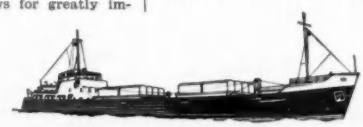
Door to Door container service to and from Northern Ireland by British Railways

Two new ships specially designed for the rapid handling of door-to-door railways container traffic are now in service between Heysham and Belfast. They are the M.V. "Container Enterprise" and the M.V. "Container Venturer".

The addition of these two highly specialised vessels will speed up and still further improve British Railways DOOR-TO-DOOR freight services between Great Britain and Northern Ireland. There are a total of 18 scheduled sailings each week.

M.V. "CONTAINER ENTERPRISE" and M.V. "CONTAINER VENTURER"

The unique design of the two ships gives deck space absolutely clear from the bridge to the forecastle head with no derricks fitted, which allows for greatly improved performance in loading and discharging by dockside cranes. Sliding hatches enable containers to be lifted and laid in the holds directly in position.



Full information from Station and Quay Superintendent, Heysham Harbour, Lancs. (Heysham 73), Shipping Traffic Superintendent, 20 Donegall Quay, Belfast (Belfast 28061) Irish Traffic Officer, Euston Station, London, N.W.1. (EUSton 1234 Ext. 526) or —any British Railways Station.

BRITISH RAILWAYS

PIONEERS IN LARGE SCALE CROSS-CHANNEL CONTAINER TRANSPORT

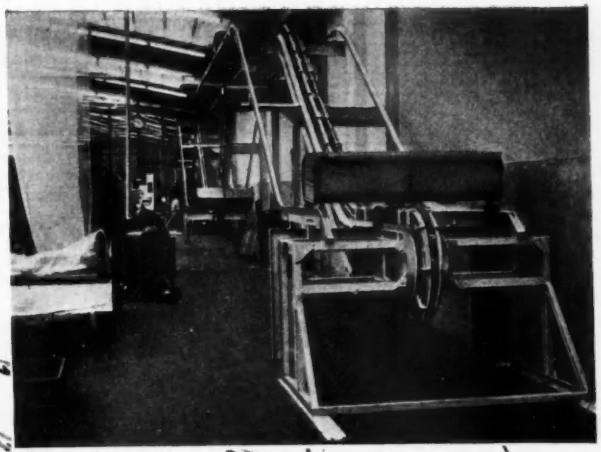
PRACTICAL TEXTBOOKS FOR THE TEXTILE INDUSTRY

	Net Price	*By Post*
COSTING IN THE WOOL TEXTILE AND OTHER INDUSTRIES By D. R. H. WILLIAMS	21s. 0d.	21s. 9d.
MACHINERY, MANAGEMENT AND CONTROL IN A WOOL TEXTILE FACTORY By D. R. H. WILLIAMS	35s. 0d.	35s. 9d.
WOOLLEN AND WORSTED YARN MANUFACTURE By J. W. RADCLIFFE	21s. 0d.	21s. 6d.
RAYON STAPLE FIBRE SPINNING By S. A. G. CALDWELL	21s. 0d.	21s. 6d.
WINDING, WARPING AND WEAVING By W. BARKER	2s. 0d.	2s. 3d.
TESTING OF YARNS AND FABRICS By N. EYRE, A.T.I.	3s. 6d.	3s. 8d.
LOOM TUNING By W. MIDDLEBROOK	2s. 6d.	2s. 9d.
PRACTICAL WARP GAITING By W. MIDDLEBROOK	3s. 6d.	3s. 8d.
HEALDS FOR WEAVING By I. LAIRD	4s. 6d.	4s. 8d.
LOOM BOX CHANGING MOTIONS By W. MIDDLEBROOK	3s. 6d.	3s. 8d.
PRIMARY ASPECTS OF THE POWER LOOM By W. MIDDLEBROOK	5s. 0d.	5s. 2d.
SECONDARY ASPECTS OF THE POWER LOOM By W. MIDDLEBROOK	5s. 0d.	5s. 2d.

EMMOTT & CO. LTD.

31 KING STREET WEST, MANCHESTER 3 and 158 TEMPLE CHAMBERS, LONDON, E.C.4

Teleflex conveyor system installed at Hollands-Zwitersche Borduurfabriek Egger N.V. Almelo. The system comprises a Universal Overhead Conveyor for the transport of cotton goods with automatic discharge.



A comparison between old and new methods. Installation by Teleflex N.V., Rotterdam.

We have the pattern for Handling at our fingertips—

The textile industry is another instance of where Teleflex handling systems are speeding production and reducing costs. Teleflex Mechanical Handling Engineers are called upon to provide many different handling systems — in their hands the problems of improved flow pattern and reduced handling costs find their ideal solution.

Please send for literature — or better still, tell us about your needs, our interest will be sincere and our recommendations frank.

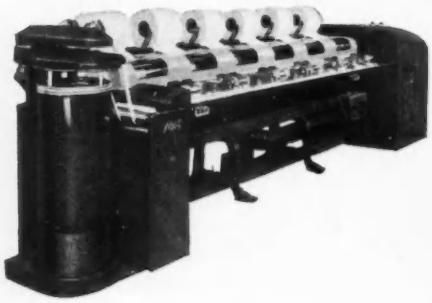
Teleflex

masters of mechanical handling

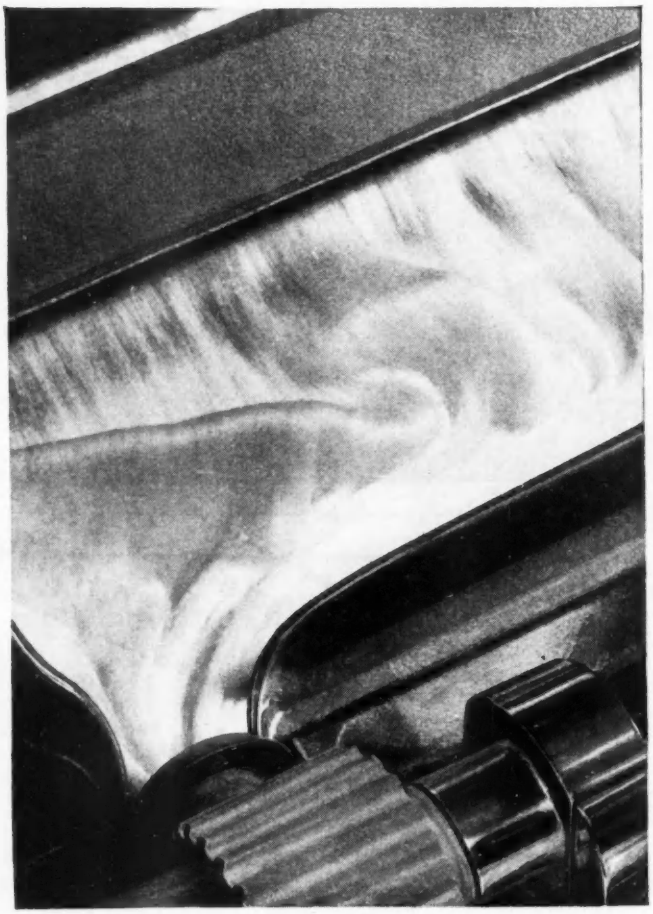
TELEFLEX PRODUCTS LTD · BASILDON · ESSEX

Telephone: Basildon 22861 (10 lines) Telegrams: Teleflex Phone Basildon
Cablegrams: Teleflex Basildon

THE 'HARTFORD' HIGH PRODUCTION COMBER



Economical upgrading now available to every mill



The capabilities of the 'Hartford' comber, showed, in one example, when upgrading at a production of 35 lb. per hour —

1. A lower grade of cotton can be used to produce the equivalent or better yarn quality.
2. Carding rates can be increased.
3. Fewer end breaks will occur at the ring frame (up to 50 per cent. reduction).
4. Lower twist factors can be used, giving a higher production at the ring frame.

PLATT BROS (SALES) LTD OLDHAM

MARKETING THE TEXTILE MACHINERY MADE IN THE WORKS OF PLATT BROTHERS & CO. LTD. HOWARD & BULLOUGH LTD. DOBSON & BARLOW LTD.

ENGLAND

Phone : MAin Oldham 6411

PERFECTION in action

Singleness of purpose and years of experience lie behind any apparently effortless performance.

And so it is with springs.

It's taken for granted that Salter Springs will keep on and on, doing their job with smooth precision — indefinitely.

But it has taken nearly two centuries of skill and devotion to achieve so great a reputation for reliability that — ironically enough — the greatest compliment paid to Salter Springs is that you can forget them!

FOR TOP PERFORMANCE — SPECIFY

SALTER

THE **ALL - ACTION** SPRINGS

GEO. SALTER & CO. LTD. WEST BROMWICH, ENGLAND.

Established 1760

Buying detergents in bulk . . .

. . . from Shell earns rebates which are well worth having. It is by far the best way of taking supplies of anionic TEEPOL 514 and nonionic NONIDET P42. Tanks can be provided and life is easier all round.

SHELL CHEMICAL COMPANY LIMITED

In association with Petrochemicals Limited and Styrene Products Limited

Divisional Offices:	LONDON	Norman House, 105-9, Strand, W.C.2. Tel: TEMple Bar 4455.
	MANCHESTER	144-6, Deansgate, 3. Tel: Deansgate 2411.
	BIRMINGHAM	14-20, Corporation Street, 2. Tel: Midland 6954.
	GLASGOW	124, St. Vincent Street, C.2. Tel: Central 9561.
	BELFAST	16-20, Rosemary Street, Belfast. Tel: Belfast 26094.
	DUBLIN	53, Middle Abbey Street. Tel: Dublin 45775.

TA.1

"TEEPOL" *and* "NONIDET" *are Registered Trade Marks.*

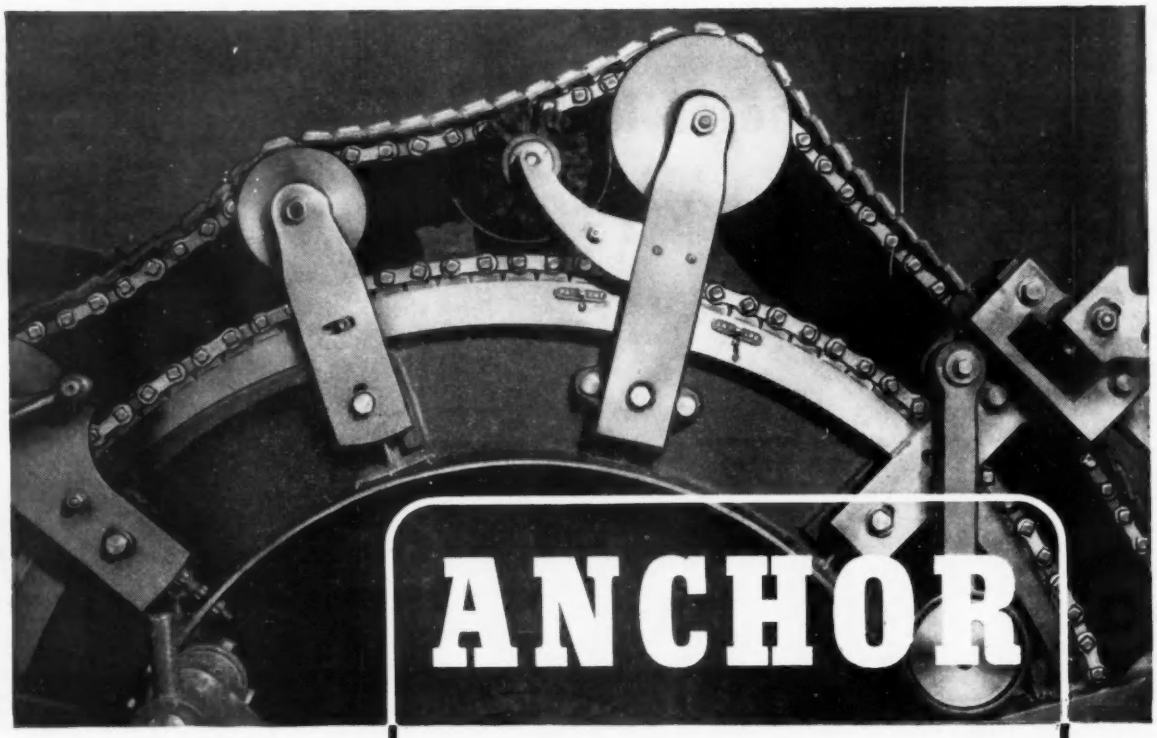
"Uster" Varimeter for testing Picker Laps

This additional device for the "Uster" Evenness Tester, which is solidly built into the Picker serves for the testing of the irregularity of the weight per unit length in the Picker Lap. Through this new possibility of use the "Uster" Evenness Tester brings further optimum advantages to its present and future users.

Zellweger USTER

Sole Agents for the United Kingdom and Eire:
G. W. Thornton & Sons Ltd., 10 Eden Place, Cheadle, Cheshire
Telephone—GATley 4271/2

Zellweger Ltd. Uster Factories for Apparatus and Machines
Uster/Zurich (Switzerland)



ANCHOR

FLAT CARD CHAINS

available FROM STOCK

A NEW SERVICE

Chains are now supplied boxed in pairs, for cleanliness of handling and storage. Right and left hand screws are also available, thus ensuring a 100% job.

ANCHOR CARD CHAINS ARE MANUFACTURED FROM HIGH QUALITY STEELS WHICH ENSURE LONG LIFE AND FREEDOM FROM BREAKDOWN. SIZES AND LENGTHS TO SUIT BRITISH, CONTINENTAL AND AMERICAN MACHINES.

ANCHOR CHAIN COMPANY LIMITED · OLDHAM · ENGLAND

(Subsidiary of RENOLD CHAINS LIMITED)

TEL: MAIN 1447 & 5928. GRAMS: "CHAINS" OLDHAM

Audley

YARNS OF QUALITY

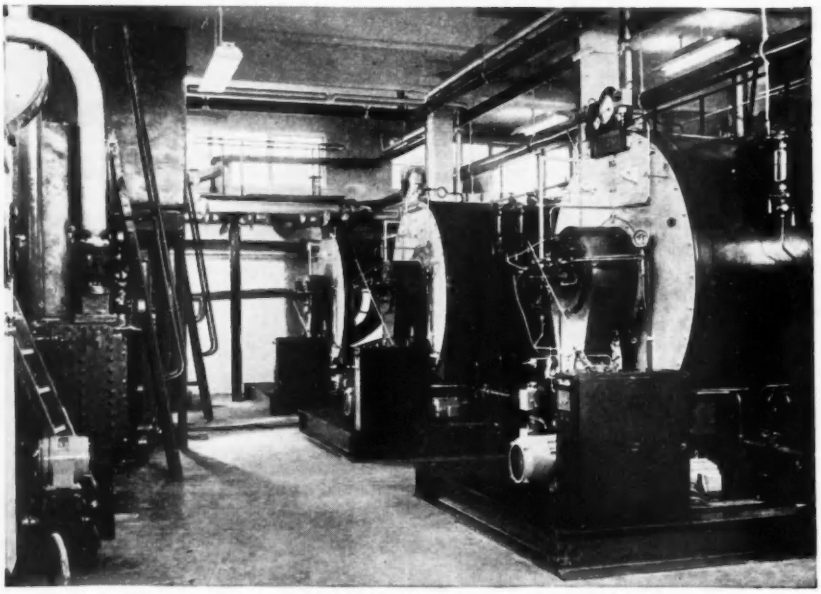
IN SPUN RAYON, ACETATE & MIXTURES
OF ALL TYPES

AUDLEY SPINNING & MANUFACTURING Co. Ltd.
Higher Audley Street Mills - Blackburn

Telephone - Blackburn 44434/5
Telegrams - "AUDSPIN" Blackburn

Alphabet of

"THE STEAMBLOC"



3 *STEAMBLOC MODEL 400 UNITS being part of a Steambloc Packaged Boiler installation supplied to the United Kingdom Atomic Energy Authority.*

Hundreds of "STEAMBLOC" fully automatic packaged boilers are giving satisfactory service at home and overseas to ADMINISTRATION COMMERCE and INDUSTRY

A ADMIRALTY · ATOMICS · AERO ENGINES AGRICULTURE · ALUMINIUM · ANTIBIOTICS ADHESIVES.

B BREWING · BAKING · BATTERIES

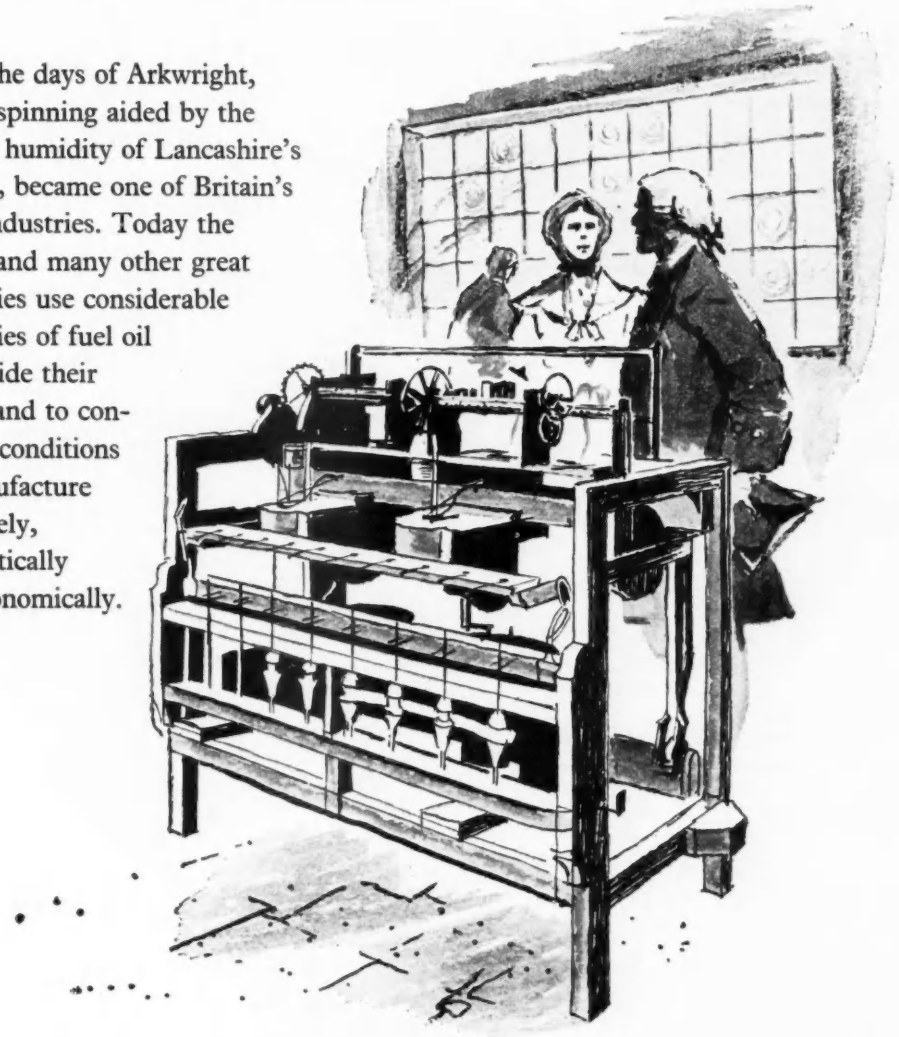
C CHEMICALS · CLOTHING · CANNING · CABLES CONFECTIONERY · CLEANING · CIGARETTES CARPETS · CATERING.

D DAIRYING · DISTILLING · DRY CLEANING DYEING.

SPENCER-BONECOURT-CLARKSON LTD.
28 EASTON STREET, LONDON, W.C.1. Telephone: Terminus 7466 Telegrams: Heatecon, Phone, London.

Early Spinners...

From the days of Arkwright, cotton spinning aided by the natural humidity of Lancashire's climate, became one of Britain's great industries. Today the cotton and many other great industries use considerable quantities of fuel oil to provide their power and to control all conditions of manufacture accurately, automatically and economically.



*

Fina Fuel Oil Technical Advisory Service is freely available to anyone interested in increasing productivity and working efficiency.

Industry can profit by using

FINA FUEL OILS

PETROFINA (GT. BRITAIN) LTD., Industrial Fuels Department

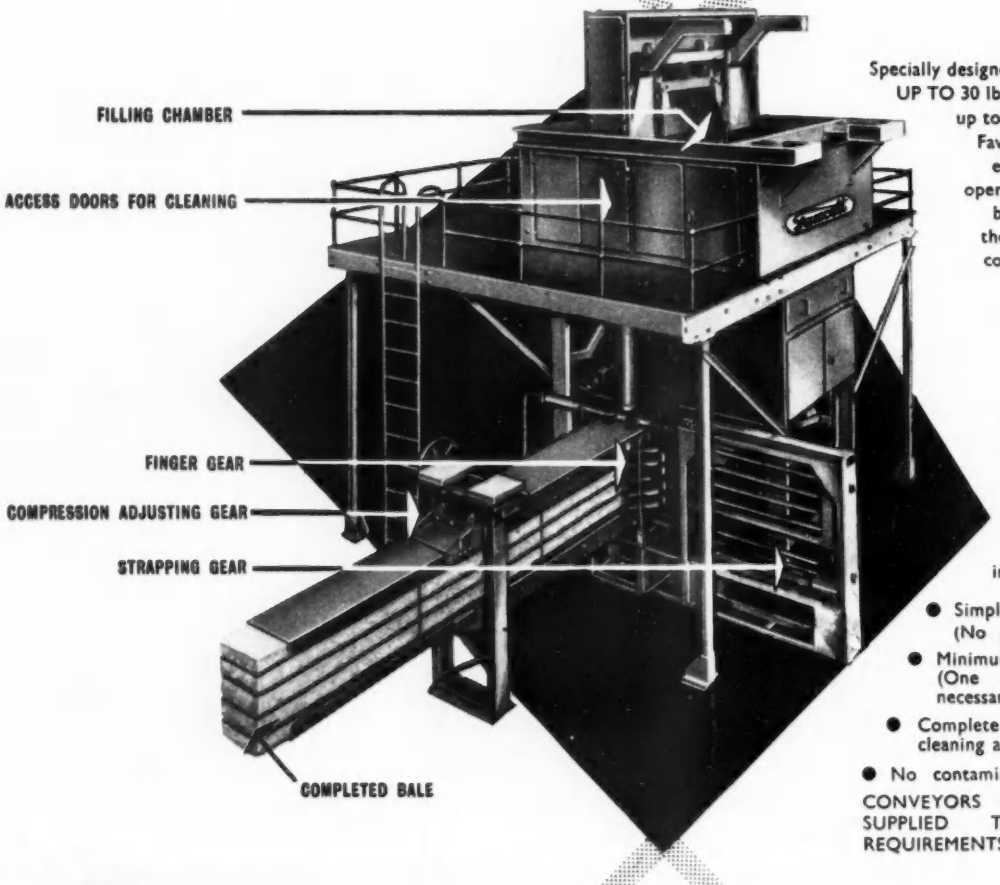
25 Victoria Street (South Block), London, S.W.1 Tel: **ABBey 7822**

THE **Fawcett**

HORIZONTAL SYNTHETIC

FIBRE BALING PRESS

FOR AUTOMATIC OPERATION



Specially designed to handle BALES UP TO 30 lbs/cu. ft. density and up to 400 lbs. weight, the Fawcett Baling Press is entirely automatic in operation with the fibre being delivered from the spinning lines by a conveyor and weigher direct to the trampling box. Full safety measures are incorporated throughout the full cycle of operation whether automatic or hand controlled. Outstanding advantages of the Fawcett Press include:—

- Simple installation. (No pits required)
- Minimum labour costs. (One operator only is necessary)
- Complete accessibility for cleaning and maintenance.
- No contamination of material.

CONVEYORS AND WEIGHERS SUPPLIED TO CUSTOMERS' REQUIREMENTS

PRESS FRAME AND BOX OF ALL-STEEL 'COLCLAD' CONSTRUCTION
HYDRAULICALLY OPERATED MAIN RAM WITH ADJUSTABLE STROKE & PRESSURE REGULATION
HOPPER DOOR OF MILD STEEL 'COLCLAD' PLATE PNEUMATICALLY OPERATED & FITTED WITH HOOD
AUTOMATIC POSITIVE LOCKING OF TRAMPLER PLATEN IN BALING POSITION
AUTOMATIC SELF-STRAPPING OF BALE
INDIVIDUAL CONTROL OF EACH OPERATION

FAWCETT PRESTON & COMPANY LIMITED

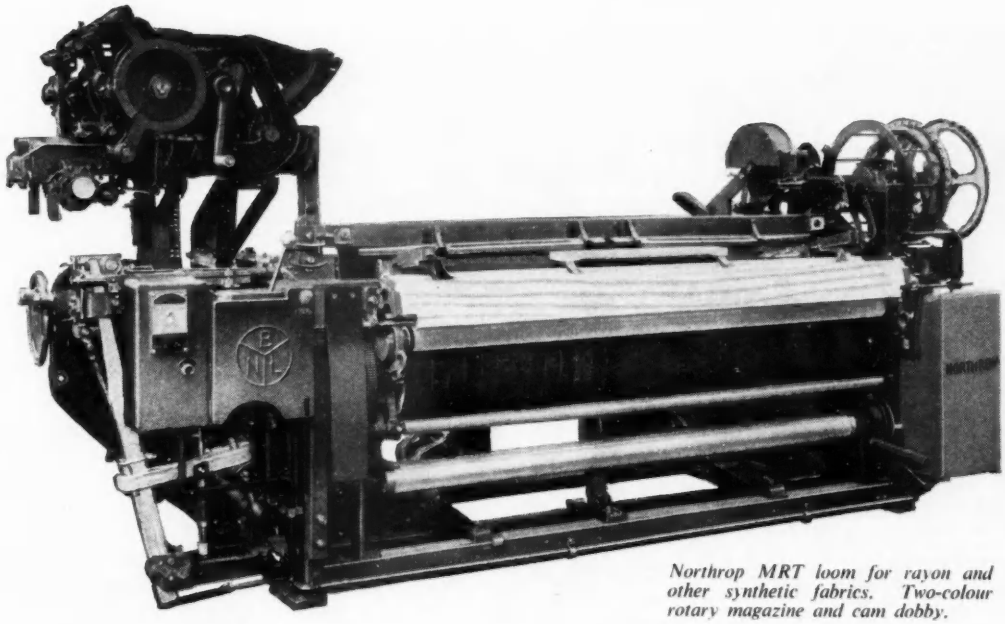
Incorporating Finney Presses

BROMBOROUGH CHESHIRE *Telephone: Rock Ferry 2201 Telegrams: 'Fawcett, Bromborough'*

Branch Offices in London, Birmingham & Glasgow.

A MEMBER OF THE METAL INDUSTRIES GROUP OF COMPANIES.

PP/155



Northrop MRT loom for rayon and other synthetic fabrics. Two-colour rotary magazine and cam dobby.

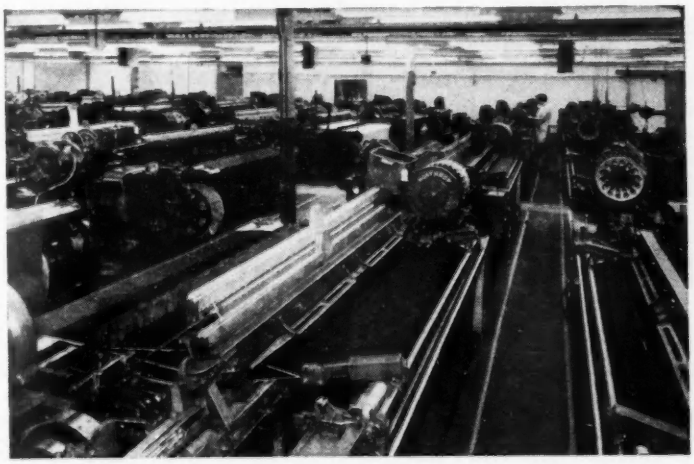
The NORTHROP MRT MODEL LOOM

—designed and built to operate at high speeds

THE NORTHROP MRT MODEL LOOM a low-built, topless, all-purpose loom, convertible from single shuttle to 2-box check, or 4-box check, or 2-box continuous weft-mixing.

THE NORTHROP MRT MODEL LOOM built with positive cam shedding motion, or negative cam-controlled dobby, or positive dobby.

THE NORTHROP MRT MODEL LOOM a loom to weave varying widths, designs and qualities of cloth of cotton, staple fibre, linen, wool, filament rayon and other man-made fibres.



"WEAVE WELL ALONE!"

BRITISH NORTHROP LIMITED

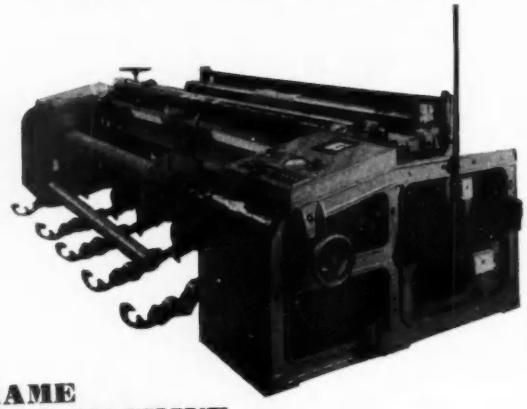
BLACKBURN • ENGLAND

Telephone: Blackburn 4065/6/7/8 *Telegrams: "Northrop, Blackburn"* BN30

BOUCHER MACHINERY for the CARPET INDUSTRY

HYDRAULIC BEAMER

Lockheed Hydraulics enable constant pressure to be applied to beam rollers, from nothing to 1,000 lbs. per square inch, each side controlled independently. Constant Peripheral Beaming Speed throughout entire range of beam, from 6" diam. barrel to 36" diam. flange, at three different speeds. Totally enclosed oil immersed Constant Speed H-Gear Unit. Warp Length guaranteed. Machine automatically cuts out at any pre-set yardage for any number of beams, until re-set.



Tube frame threaded with the spool in its spring holders; eliminates four operations (patents pending). Needles are brought forward by simple foot operated switch, leaving operatives' hands free to attend to interrupted ends and return to thread by the same operation. Tube frames can be threaded as fast as removed from the chain, thus facilitating immediate return to their last position in the chain. All needles have rounded crochet hook ends, preventing yarn damage and enabling smoother threading. All spool end strive difficulties overcome enabling, 100% threading even if strive is as much as 1" by our new full length comb. By fitting side supports the standard 4/4 machine can thread 2/4 to 16/4 Tube frames, or a machine can be supplied 12/4 in width. Tube Frame automatically clamped eliminating still a further hand operation.

TUBE FRAME THREADING MACHINE

"CONSOLE" HIGH SPEED CARD CUTTER

Easier to use than a type-writer! Operator can be trained within an hour. Quick and simple method of colour selection only 1½ inches from the design paper. Automatically stops when card is cut, automatic numbering device, centralised lubrication system, high cutting speed and rapid conversion to other card sizes. Operator fatigue reduced to a minimum for the machine takes care of the Brainwork.

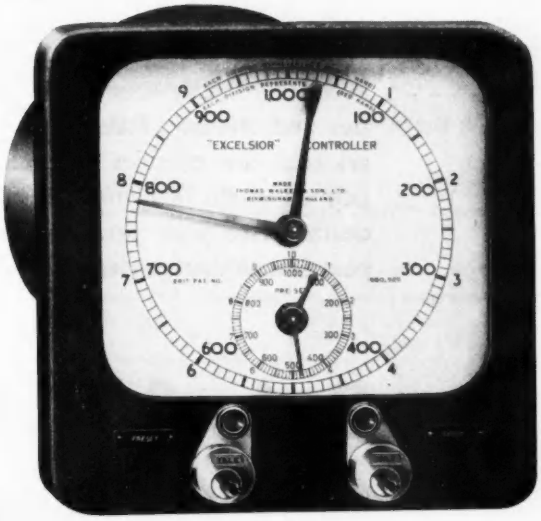
Boucher AND CO. LTD.
PIKE MILLS · NEW ROAD
KIDDERMINSTER · WORCS.

Telephone No.: KIDDERMINSTER 4711 (10 lines)

Do these problems loom large in your production

Then, perhaps, we can remove that troubled frown! Our many years of experience are at your disposal. Single units or a regular supply of complete instruments or components will help you to save money!

Accurate and reliable instruments for control, counting, and sequence operations have been supplied by WALKER'S to the Textile, Wire drawing, Plastics and many other industries—standard controls may meet your exact requirements; if not, we shall be pleased to design to your specification.



Illustrated above is the 'EXCELSIOR' Mark IV Controller to give fully automatic control of pre-determined measured lengths.

Consult

WALKER'S

'Phone: MIDLAND 5474

THOMAS WALKER and SON, LTD.
58 OXFORD STREET, BIRMINGHAM 5

You can't send a rat to Prison

He would soon tunnel his way out, just as easily as he and his larger-every-day family tunnel and gnaw their way through valuable properties and stores. Rats, also mice, cockroaches, bugs, fleas, ants and crickets, are enemies of society, causing hundreds of thousands of pounds worth of damage and total loss each year and must be put to death. Are your premises infested by vermin? Then call in our pest destruction service NOW.

B. L. & N. PHILLIPS LTD.

Vermin Destroyers

124 SOUTHWARK STREET, LONDON S.E.1. **Tel: WATerloo 5546.**

BIRMINGHAM : 208 County Chambers, 66½ Corporation Street. Tel. : Central 1176

BRISTOL : Swan House, 112 Hotwell Road 8. Tel. : Bristol 20512, Ext. 5

EXETER : 21 Church Lane, Sidwell Street. Tel. : Exeter 54181

EDINBURGH : Pesticidal Services (Scotland) Ltd. 34 Bernard Street, Leith 6. Tel : Leith 38393

GLASGOW : Pesticidal Services (Scotland) Ltd., 93 Waterloo Street. Tel. : City 0735

SOUTHAMPTON : 14 Howard Road, Shirley. Tel. : Southampton 25307

LEEDS : 21 Upper Mill Hill. Tel. : Leeds 2-5266

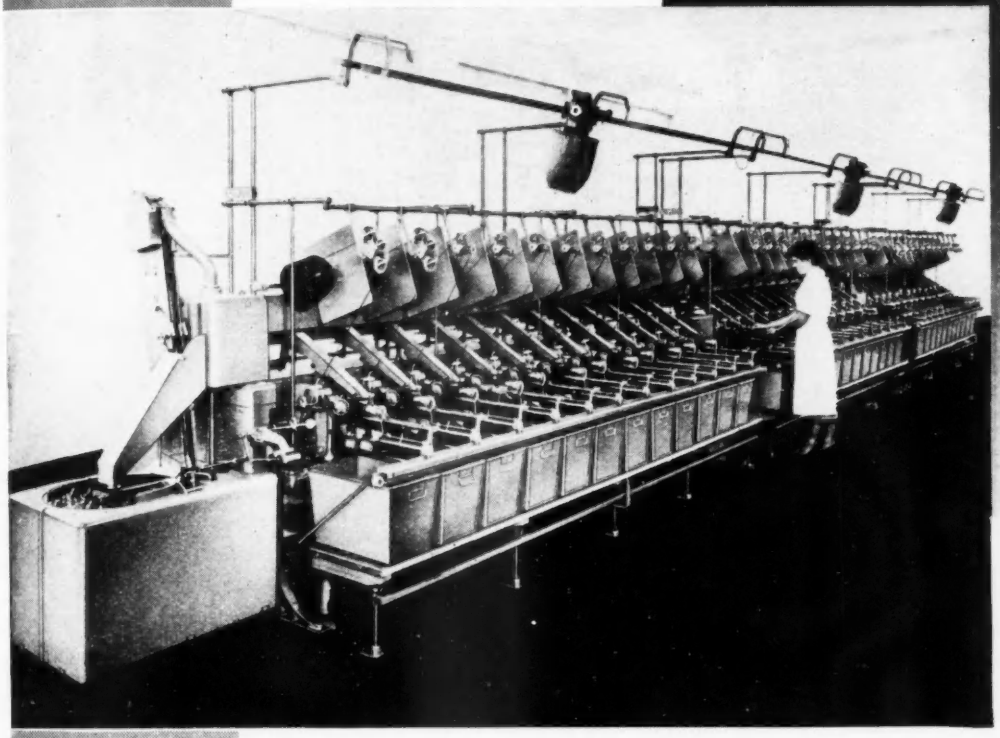
LIVERPOOL : 8a Rumford Place, 3. Tel. : Central 2068

BELFAST : Pesticidal Services (Ireland) Ltd 153 Upper North Street. Tel.: Belfast 26998.

Automatic Supercop Winder

with automatic feed of supercrop bases

MTSZ



A development of our well established M.T.S. Cop Winder which makes it possible to increase the yarn content of the shuttle.

Although woollen yarns of finer counts than 11 skeins cannot be unwound from hollow cops, it is possible to use supercops both for coarse and fine counts of yarn without difficulty because the yarn is unwound from the outside.

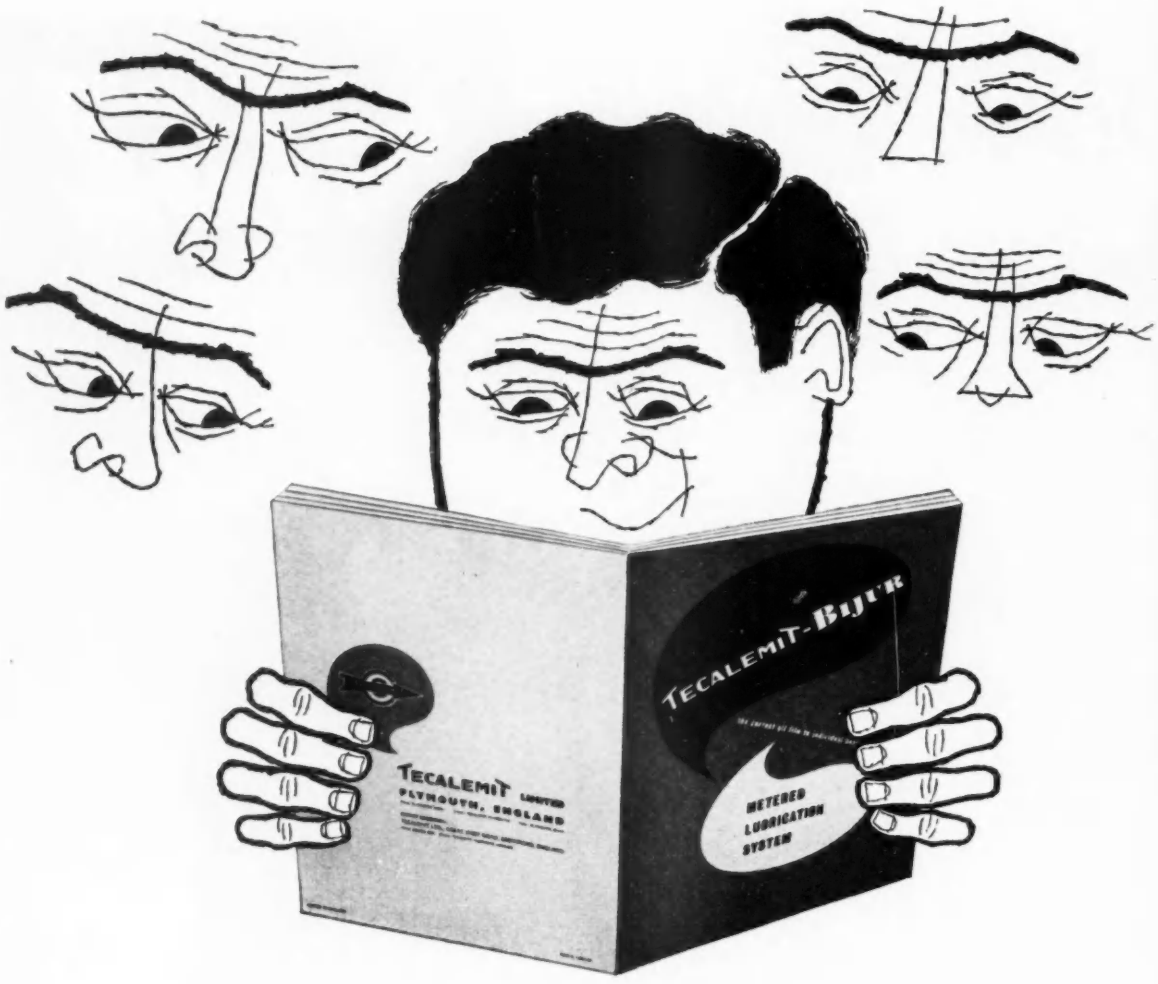
For automatic shuttle changing looms and for mechanical looms fitted with weft feeler motion, supercops with bunch are necessary. The Automatic Supercop Winder M.T.S.Z. is designed to wind supercops with or without bunch.

- **The machine is simple to handle and its functions are fully automatic.**
- **Each unit works independently of the other.**
- **Individual drive by friction disc.**
- **Automatic changing of the fully wound supercop, with automatic restarting of the winding.**
- **Automatic stop motion at broken end.**
- **Feeler cone and all shafts run on ball bearings.**

SCHWEITER LTD
HORGEN-(Zürich) Switzerland

SOLE AGENTS FOR THE UNITED KINGDOM AND EIRE :

LIVESEY & ASPINALL LIMITED
16 CUMBERLAND STREET : MANCHESTER 3
Telephone: BLAckfriars 6970 Telegrams: "WYNDERISE" Manchester



Inside information on metered lubrication

Tecalemit 'Bijur' Metered Lubrication has been proved successful in thousands of installations, from industrial sewing machines to some of the largest carpet looms. It automatically provides the correct amount of clean, filtered oil to all moving parts, giving higher speed, heavier loadings, longer runs and above all longer machine life.

write for this new book *containing full detailed information including:—*

Automatic and hand-operated lubricators.
Rotary and reciprocating drives.
Dimensioned drawings of lubricators, valves and fittings.

TECALEMIT TECALEMIT

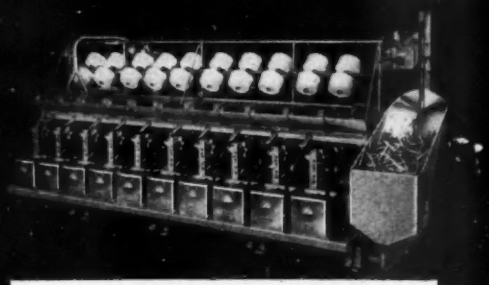
TECALEMIT LIMITED (Sales T.M.) Plymouth, Devon. Phone: Plymouth 62844. Grams: Tecalemit, Plymouth. Telex: Plymouth 45-145

T645

Schärer

Fully Automatic Pirn Winding Machine

for cotton and spun rayon, speed variable from 8000 to 11000 revs.



Advantages:

Standard machine with 10 winding units
It offers a great versatility to your weaving mill

Low Frame, Simplicity of construction
The work of the operative is reduced to a minimum

Double end swivelling creel
Permits a quick change from the empty to the full supply package

Automatic Stacking of the wound pirns
into boxes which can be carried direct to the loom.

Drive by V-belts
Each winding unit runs at the same speed

Simplicity of the winding mechanism
The gears are running in a dust-proof oil-bath

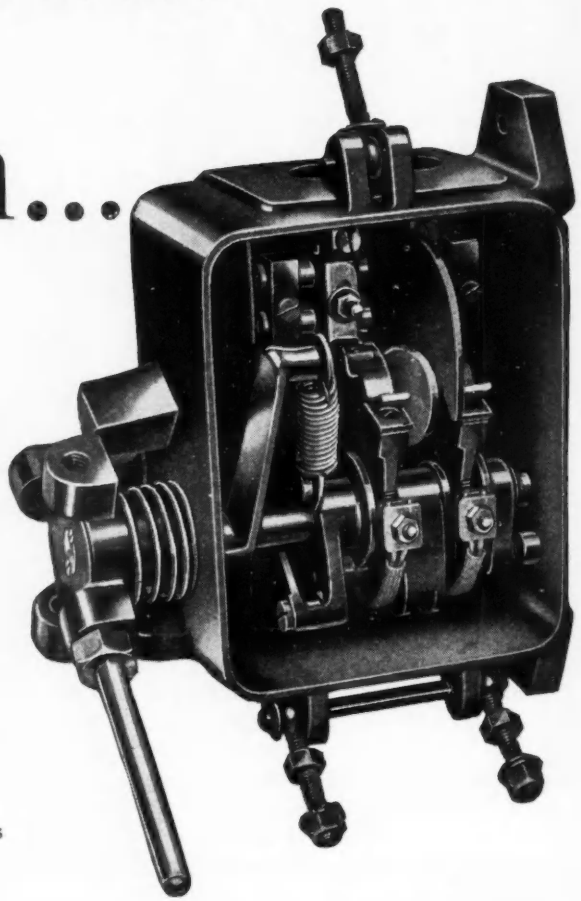
Ask for further details! Profit by our long experience, do not hesitate to consult us if you have any pirnwinding problems.

Schärer Textile Machine Works
Erlenbach/Zurich (Switzerland)

Sole British Agents: G. W. Thornton & Sons Ltd., 10 Eden Place, Cheadle, Cheshire. Tel. : GATley 4271

Use it little...

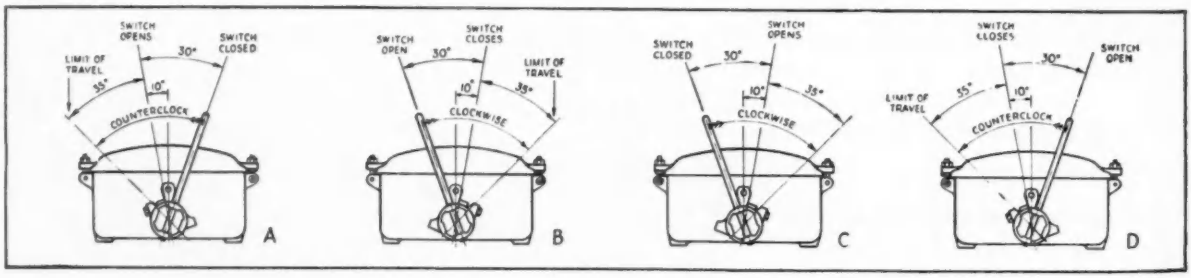
use it much...



When a moment of emergency arises an Ellison tappet operated limit switch can be relied upon to operate with certainty. Whether intended for long periods of idleness, or for frequent operation, an Ellison limit switch is your assurance of security. Whatever the use or the time you will be glad you installed an Ellison limit switch.
Write for List No. 11 for details and illustrations.

DC SERIES LIMIT SWITCH
Single-pole, double break D.C. Made in three sizes for maximum current carrying capacities of 35, 75 and 150 amps respectively at 660 volts.

AC SERIES LIMIT SWITCH
Double-pole in two sizes for maximum carrying capacities for 75 and 150 amps respectively at 660 volts.



ROTATION OF OPERATION OF A.C. SERIES LIMIT SWITCH

A *Switch "normally closed", counter-clockwise operation to "open".*
B *Switch "normally open", clockwise operation to "close".*
C *Switch "normally closed", clockwise operation to "open".*
D *Switch "normally open", counter-clockwise operation to "close".*

YOU CAN RELY ON AN ELLISON PRODUCT

TRADE (E) MARK
GEORGE ELLISON
LIMITED
BIRMINGHAM ENGLAND

763/G122

I'm Ringelmann Zero!

You're **"in the clear"** with
Mr. Therm's Smokeless Coke and Gas.
For expert technical advice on Smokeless Fuel
consult your Area Gas Board.

AND** – 11 million housewives cook by **GAS!

Issued by the Gas Council

INDUSTRIAL FABRICS IN COTTON AND SYNTHETIC FIBRES

John Bright, M.P.
1811-1889

JOHN BRIGHT AND BROTHERS LIMITED
SPINNERS · DOUBLERS · MANUFACTURERS
ROCHDALE
TELEPHONE: ROCHDALE 4141 (5 LINES) ESTABLISHED 1809 TELEGRAMS "BRIGHTS" ROCHDALE

AEROSOL-TURBO

– finest humidifiers in the world

Illustrating the Universal Model No. W.573, the latest addition to our comprehensive range of Humidifying Units, combining Controlled Humidity with — Air Washing — Air Change (3,000 cubic feet per minute) — Air Recirculation — Air Cooling.

In addition a built in Air Filter ensures trouble free operation under the most arduous conditions.

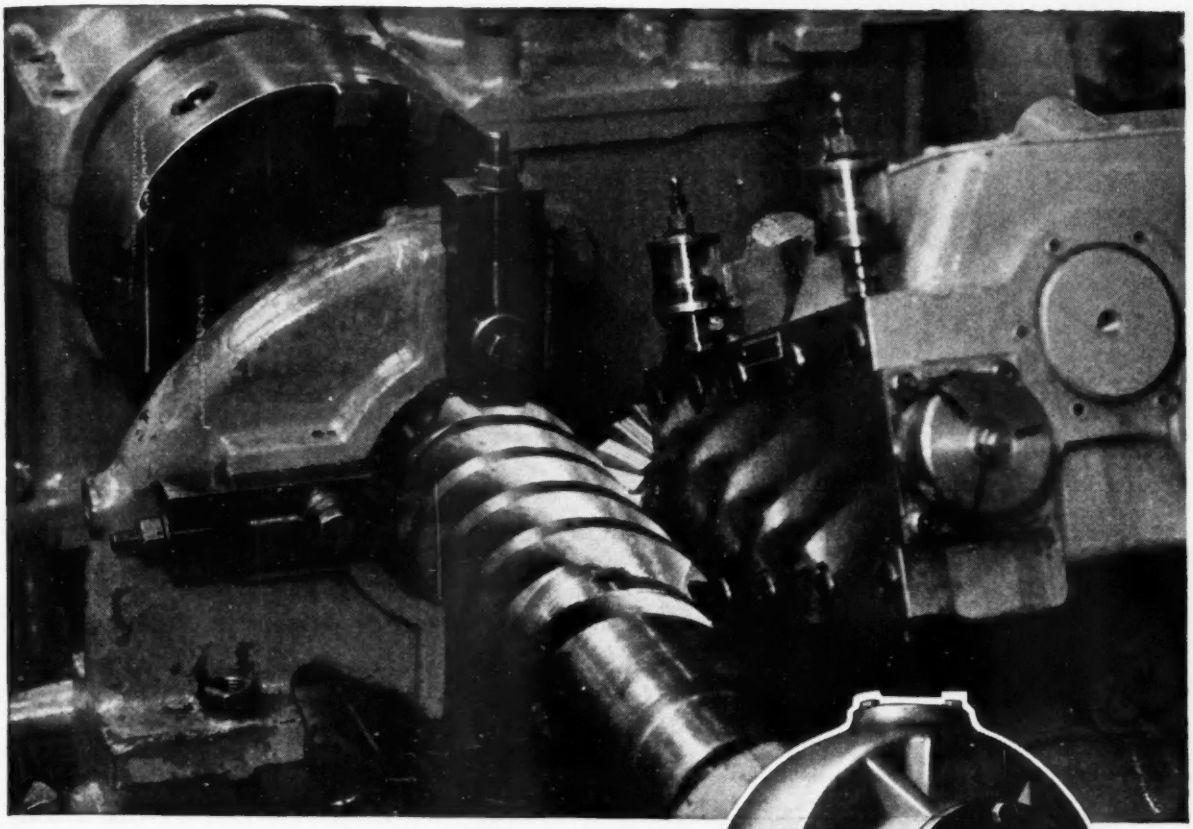
Guaranteed non-wetting. A Heater Battery can be incorporated if required.

P M WALKER

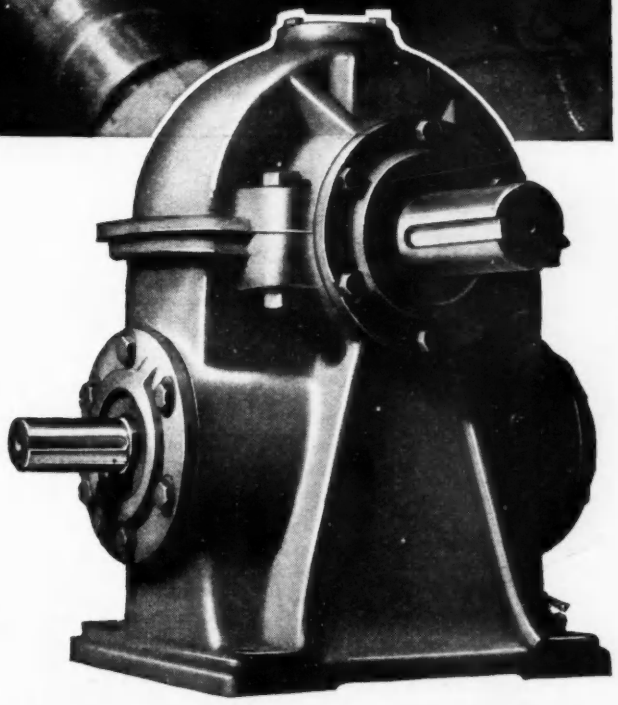
P. M. WALKER & CO. (HALIFAX) LTD.
AIR TREATMENT ENGINEERS
ALEXANDRA WORKS, HOPWOOD LANE, HALIFAX
Tel. 60346 (5 lines)
Grams. 'EXHAUST, HALIFAX'

MADE IN BRITAIN

Manufacturers of the Walker 'UPBLAST' Powered Roof Ventilator



TURNING THE WORM!



...or more accurately, perhaps, "generating the worm" for one of the many sizes of gear in the Stone-Wallwork range... well known and generally appraised for trouble-free working and long life.

Within this range there are units with ratios and power capacities to suit most purposes, from fractional horse-power up to 250 h.p. Write for comprehensive data sheets. Special requirements can be catered for.

STONE-WALLWORK LTD.

32 VICTORIA STREET, LONDON, S.W.1.
Telephone: ABBey 7681 Telegrams: "Stonwalabb" Sowest, London
BLEASBY STREET, OLDHAM, LANCASHIRE.
WINDSOR WORKS STOTFOLD. BEDFORDSHIRE.

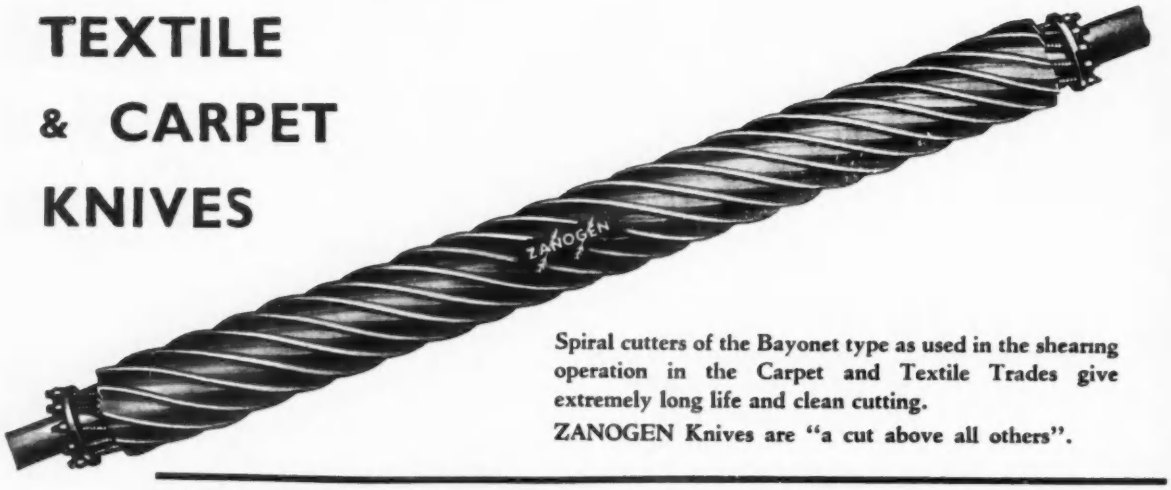
Also manufacturers of the well-known P.I.V. (Positive Infinitely Variable) Speed Chain Gears, Piece Goods Stamping Machines and Light Alloy Bobbins for the Textile Trade.

STONE-
WALLWORK
WORM GEARS

The J. Stone Group

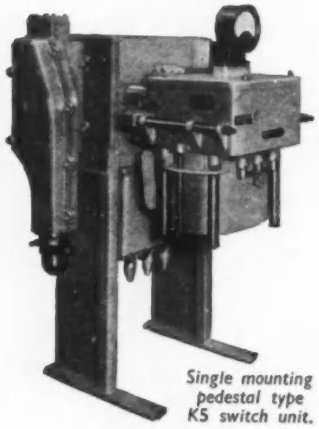
ZANOGEN

TEXTILE & CARPET KNIVES



Spiral cutters of the Bayonet type as used in the shearing operation in the Carpet and Textile Trades give extremely long life and clean cutting.
ZANOGEN Knives are "a cut above all others".

W. FEARNEHOUGH LIMITED
GARDEN STREET WORKS · SHEFFIELD 1 ESTABLISHED 1832



Single mounting pedestal type K5 switch unit.

TYPE
'K'
medium voltage
SWITCHGEAR

—can be installed at the most convenient places

***and* AS YOU NEED IT**
(Pedestal, Panel or Cubicle mounted)
—A good performance is guaranteed

The range of switchgear generally designated "Type K" has been specially developed to provide efficient distribution of electric power within mills, factories, office buildings, etc., where the need for continuous and reliable supply is of the first importance.

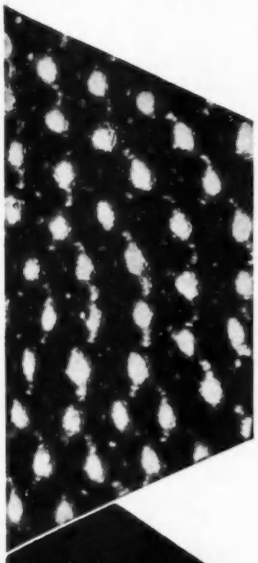
It is outstanding for its dependable performance and versatility of arrangement to suit particular site conditions. The switchgear is designed for use on systems up to 600 V and for normal current ratings up to 1800 A, with busbar capacities up to 2500 A. Complying with Factory and Home Office Regulations and the requirements of the appropriate British Standards, it is suitable for general use in factories, and includes oil circuit-breakers adaptable to direct-on motor starting.

"K" industrial switchgear can be supplied for pedestal, cubicle or wall mounting and the varied cabling arrangements available enable this gear to be easily installed in sites where space limitation is a major factor. The circuit-breakers can also be mounted on the front of existing panels or cubicles.

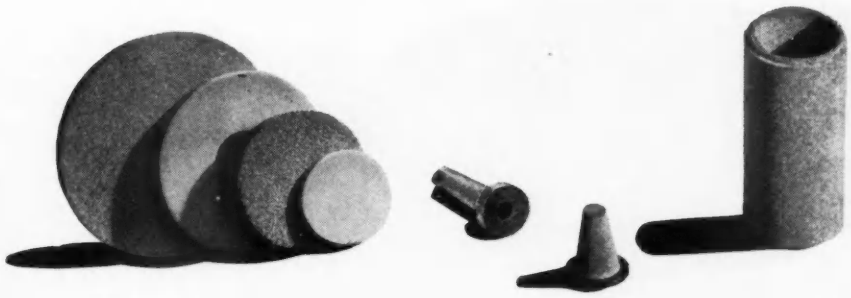
Simplicity of operation and easy maintenance are salient features of this switchgear, whilst adequate interlocks are provided to safeguard the operator.

Extension is easy by virtue of unit construction—in fact, it is AS YOU LIKE IT and AS YOU NEED IT.

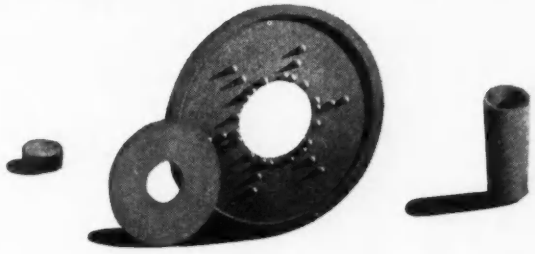
Ferguson Pailin LIMITED *for Switchgear*
Member of the A.E.I. Group of Companies
Head Office & Works: **HR. OPENSHAW MANCHESTER 11,** Telephone: DROylsden 1301 (Pte Branch Exs)
LONDON OFFICE: Bush House, Aldwych, W.C.2 BIRMINGHAM OFFICE: Windsor House, 65b Chester Road, Erdington 23 GLASGOW OFFICE: Central Chambers, 109 Hope Street, C4
REPRESENTED IN PRINCIPAL OVERSEAS TERRITORIES



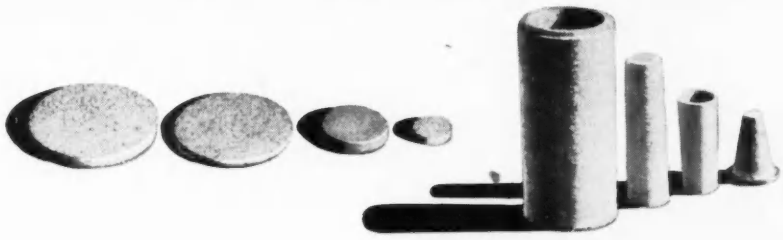
This microphotograph shows a section of a Bound Brook Filter. Note the porous structure formed by the use of spherical powdered metals.



metal powder technique produces...



long-lasting bronze filters



graded for use with **liquids and gases**

The result of many years' experience in powder metallurgy has been the development by BOUND BROOK of a porous material for the filtering of liquids and gases. It is produced from spherical metal powders of **closely controlled particle size** to give a rigid porous bronze structure of **uniform pore dimensions.** This metallic structure has excellent resistance to impact, is suitable for high pressure filtration in both directions of flow, better resistance at **high temperature** than wool, cotton, paper or plastic filters, and enjoys an almost indefinite life. The material is easily cleaned either by washing or by reversing the flow. Designed for such applications as filter elements, flow control devices, flame traps, etc., Bound Brook bronze filters are available in six grades to suit required conditions and in the form of discs, plates, cones, hollow cylinders, etc. Special shapes can be made to suit customers' requirements. Special cupro-nickel is also available for corrosion resistance.

MEMBER OF

THE **BIRFIELD** GROUP

Bound Brook Bearings Limited

Trent Valley Trading Estate, Lichfield, Staffordshire

Tel: Lichfield 2027-8 Telegrams: Boundless · Lichfield

EVERLUBE DRY FILM LUBRICATION...

FOR SMOOTHER WORKING

Write at once for further details

THE SCIENTIFIC FUSED ON DRY LUBRICANT

. . . is permanent, clean and dry.

. . . does not blister, peel or crack.

. . . is unaffected by extreme heat, hydrocarbons or most solvents.

. . . can be air-dried or baked on almost any metal.

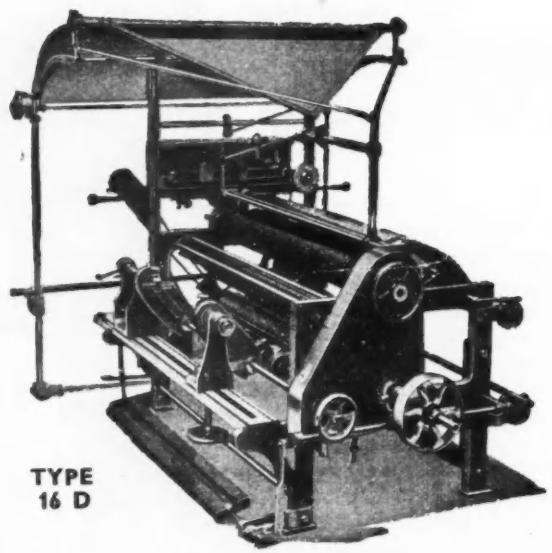
and most important . . .

EVERLUBE REDUCES COST BY STOPPING WEAR

STEDALL MACHINE TOOL CO.

Also at London, Bristol and Manchester

OLDBURY RD., ALBION, WEST BROMWICH
Telephone: WEST BROMWICH 0561



TYPE 16 D

Textile Machine Makers and Electrical Engineers

A&H SIMONETT (ENGINEERS) LTD.

RIGGING ROLLING & MEASURING MACHINE

- Gives ACCURACY of MEASUREMENT upon all Fabrics, including Stretchable or Non-Stretchable Goods.
- MEASURING DRUM driven by machine.
- CONTROLLED CLOTH TENSION.
- ELECTRICALLY OPERATING AUTOMATIC GUIDERS ensures accurate rigging.
- Rolling Motion fitted with DOUBLE END DRIVE.
- Can be used for Rolling and Measuring of Single Width Fabrics.

Specialities:

Cropping and Shearing
Rigging and Cuttling
Inspecting and Measuring
Stamping, Rolling and Measuring Machines

WESTHOLME WORKS,
Thornton Road, BRADFORD

Telephone : Bradford 22381/2

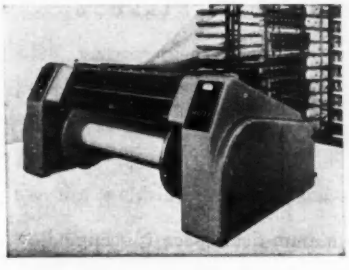
Telegrams : "Shearig, Bradford"

Are you aware of the fact

- that with preparatory equipment only the best is good enough and that price is not the most important factor?
Do you want to "earn" some £ 100 when buying a sizing or warping machine or would you rather have an installation which guarantees high productivity and first class warps for many years to come?

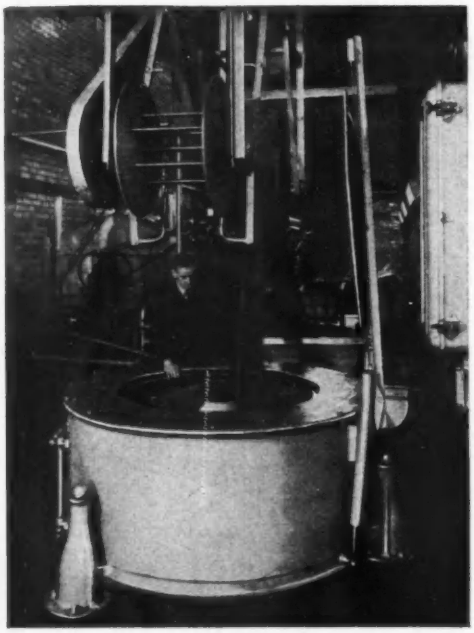
With the drop roller of this interesting design every broken end can be pieced, and the direct beam drive with pneumatic pressure even enables warping of the softest dye-beams.
All staple fibres and filament **yarns** can be processed.
We shall be pleased to send you additional information on the large number of further operational features.

RUTI



Ruti Machinery Works Ltd., Ruti-Zurich
formerly Caspar Honegger Switzerland

Sole Agents for Great Britain and Ireland: **GEOFFREY E. MACPHERSON (.E) LTD. West Bridgford, NOTTINGHAM**



HIGH-SPEED EXTRACTORS

Correct BROADBENT EXTRACTION solves textile drying problems economically and efficiently, fuel costs are reduced and all materials are dried to a uniform moisture content without damage—even to the most delicate fabrics.

The Type 4(28) Extractor illustrated, powered by a direct coupled Broadbent motor specially designed for extraction duties, combines rapid acceleration with low running costs and is available in three sizes 48″ (1,220 mm.), 60″ (1,524 mm.) and 72″ (1,829 mm.) basket diameters, supplied in suitable constructional materials.

INVESTIGATE THESE BROADBENT PROFIT INCREASING SPECIALITIES

CENTRIFUGAL CLUTCHES

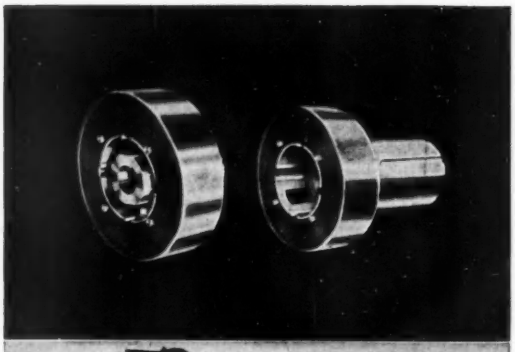
Give smooth controlled transmission automatically and by allowing the motor to start under no-load conditions dispense with expensive starting equipment. The gradual engagement eliminates broken ends and the bonded shoe linings have three times the life of riveted or screwed-on linings.

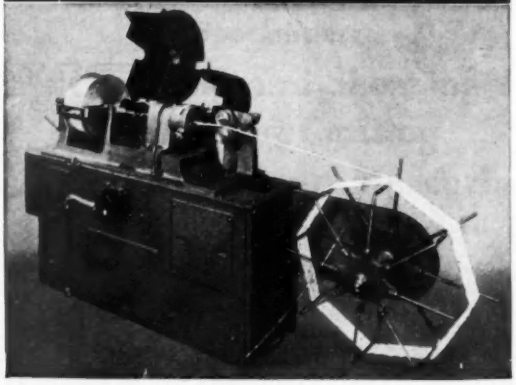
YARN CURLING MACHINERY

Versatile automatic Broadbent Yarn Curling replaces laborious hand curling with economical uniform production.

Many novel and interesting textures for modern textiles and interior furnishings are easily produced and minimum floor space is occupied.

send for further details NOW!





THOMAS BROADBENT & SONS LTD.. HUDDERSFIELD. ENGLAND

PHONE 5520/5 *GRAMS BROADBENT

THE TEXTILE MANUFACTURER

©
1958:
EMMOTT AND CO. LTD., MANCHESTER

MATERIALS - PROCESSES - PRODUCTION - MANAGEMENT

NO. 1008. VOL. 84 - DECEMBER 1958 - MONTHLY Two Shillings and Sixpence

CONTENTS

ARTICLES

	Page
ECONOMICS, RESEARCH, ADMINISTRATION	
Catalysis and Activation of Bleach Liquors	597
Continuous Peroxide Bleaching	598
Kier Treatment for Protection Against Iron	600
Organic Pigments on Textiles	601
New Class of Spun Yarns	602
FABRICS AND DESIGN	
Modern Cotton and Rayon Furnishings	603
Metallic Yarns in Terry Towels	612
MANAGEMENT, MACHINERY AND PROCESSES	
T.P.K. Sizing in Sacking Manufacture	604
Effect of Temperature in Sizing Jute	605
New Top Clearer for Speedframes	607
New Cop Sorting Machine	608
Stretch Breaking and Spinning "Terylene" Tow	608
Metallic Threads in Terry Towels	609
Jacquard Particulars for Terry Towels	613
Washing Nylon Overalls	614
New Design of Chlorinator	615
Transport and Storage of Bulk Liquids	615
New Rag Machine Offers Double Output	616
Nylon for Tyres	618
Mating Swift, Workers and Doffer of Woollen Card	619
Effect of Varying Swift and Worker Clothing	620
Fully Automatic Yarn Tester	622
New Centre-Weft Fork Motion	623
Weft Cutting on Automatic Looms	623
New Automatic Selvedge Trimmer	624
Dry-Marker Saves Time	625
TEXTILE COLOURIST AND FINISHER	
New Dyeing and Finishing Processes	526
Flame-Proofing Viscose Rayon Fabrics	526
Wetting Agent for Mercerising Liquors	527
Anti-Static Synthetic Fibres	527
Waterproofing Cotton Goods with Silicones	528
Dyeing "Orlon"	528
New Dyes for Wool and Other Nitrogenous Fibres	630
Diazo Reaction in Dyeing	631
Mechanism of the Diazotisation Reaction	632
Mechanism of the Coupling Process	633
Life and Times of Peter Griess	633
Book Reviews	634
MARKET INTELLIGENCE	
Cotton Yarn and Cloth Markets	637
Wool Consumption and Production	637
Linen Trade Review	637
Man-Made Fibres and Cloths	638
Jute Fibre and Fabrics	638
Notes and News	639
Recent Textile Patents	641

NOTES OF THE MONTH

Swedish Market for Scottish Knitwear	595
Cotton Textile Promotional Activities	595

THE TEXTILE MANUFACTURER (*Incorporating* TEXTILE INDUSTRY AND EXPORTER, THE TEXTILE MACHINIST, THE HOSIERY, LACE AND SILK MANUFACTURER, *and* THE TEXTILE COLOURIST) is published on the first Monday of every month.

MANCHESTER
31 KING STREET WEST, 3.
Telephone: BLACKFRIARS 7086 (2 lines).
Telegraphic Address: Textile, Manchester.

LONDON
158 TEMPLE CHAMBERS, TEMPLE AVENUE, E.C.4.
Telephone: FLEet St., 8914.

Contributions: The Editor invites exclusive contributions of special interest to the textile industries and will return promptly unaccepted articles, MSS. or photographs.

Subscriptions: 30s. per annum, Home or Overseas. Single copies 2s. 6d., by post 3s. 6d.

Communications and inquiries concerning advertisements should be addressed to 31 King Street West, Manchester 3.

Remittances to be made payable to the publishers, Emmott & Co. Ltd. and crossed "Midland Bank Limited."

"Williams—Sellers" Combined Scouring and Milling Machine

A PRECISION BUILT, FULLY CONTROLLABLE MACHINE GIVING EFFICIENT SCOURING AND MILLING WITH CONSIDERABLE SAVING IN PRODUCTION. ADAPTABLE FOR MANY TYPES OF TEXTILE FABRICS

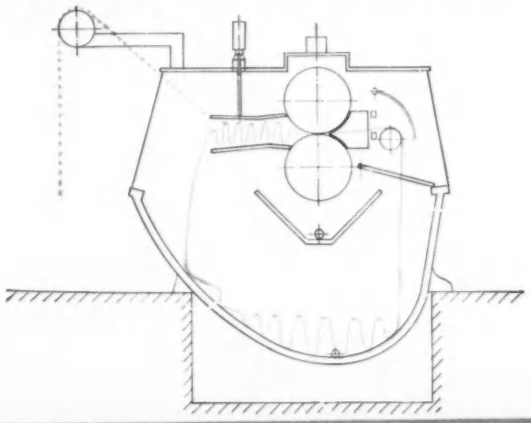
SAVING £s

ONE MACHINE EMPLOYED IN COMPARISON TO SEVEN MACHINES
15 H.P. EMPLOYED IN COMPARISON TO 60 H.P.

TODAY

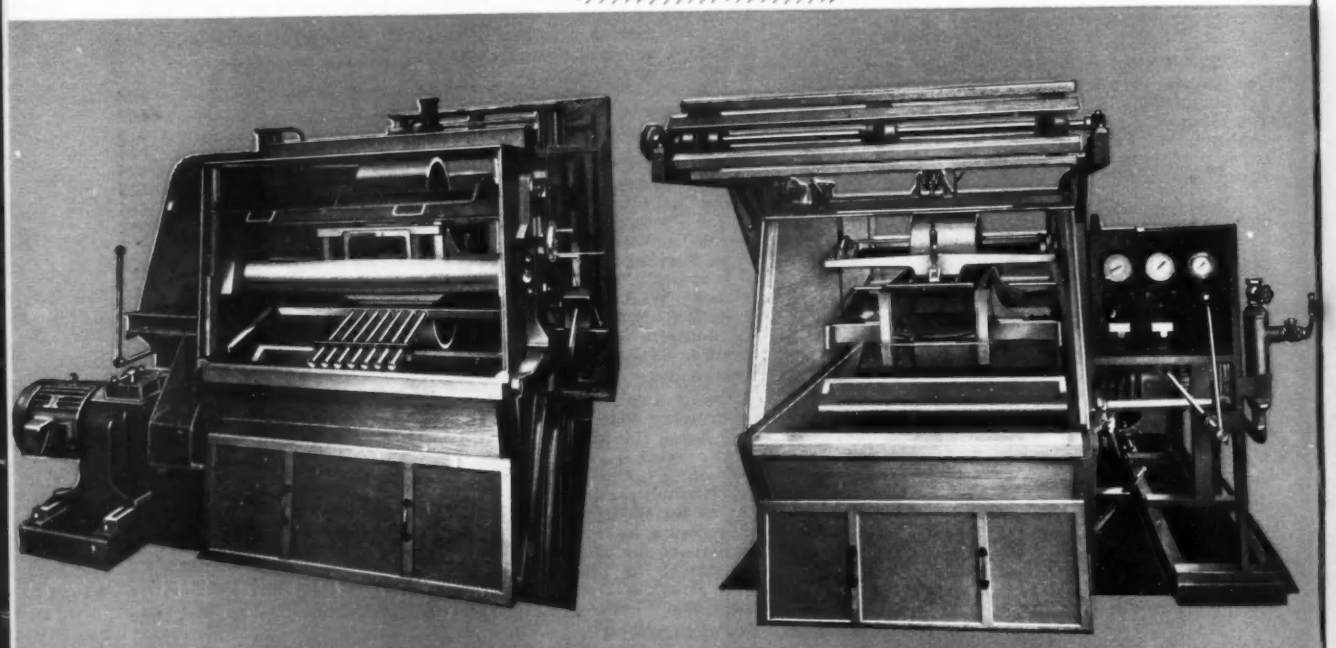
One "Williams-Sellers" 60" wide Combined Scouring and Milling Machine

WRITE FOR FULL SPECIFICATION



YESTERDAY

1—6' 0" Scouring Machine
2—6' 0" Hydro Extractors
3—10" Milling Machines
1—6' 0" Washing-off Machine



THE MACHINES THAT MADE THEIR WAY BY THE WAY THEY ARE MADE

Sellers
AND COMPANY (HUDDERSFIELD) LTD.

Phone: 4271 (4 lines)

HUDDERSFIELD

Cables "Machinery."

THE TEXTILE MANUFACTURER

No. 1008. Vol. 84 Two Shillings and Sixpence December, 1958

Notes of the Month

NEED FOR VIGOUR AND IMAGINATION

If the textile and clothing industries were to hold their own in the competition for the public's money, they would need to keep up to date on good design, both contemporary and traditional, and the habits of life of the public, said Mr. F. J. Erroll, M.P. (Economic Secretary, the Treasury) when he addressed the recent annual convocation of the Textile Institute. The various sections of the textile and clothing industries, he went on, had a common interest in the development of new techniques of manufacture, new methods of marketing and distribution, and in the improvement of design. Some sections, like the cotton industry, faced severe problems of adjustment but for all sections a vigorous and imaginative approach and a willingness to draw upon the resources of modern textile technology, when allied to traditional skills, should bring their own rewards.

The Textile Institute could play a valuable role in making this possible. The speed of change was now so great that it was essential in the textile industry to keep abreast of developments, not only in their own country but in all countries with advanced textile industries and research bodies of their own. So long as the textile industries remained in the forefront of technical development, they ought to be as well able as any other to stand up to the effect of the changes going on. Admittedly, the techniques of textile manufacture were still based on the traditional skills of spinner, weaver and knitter, but these techniques were now powerfully reinforced by the scientific evolution of the chemical and plastics industries. New methods of testing, quality control, changes in the structure of fabrics, new techniques in dyeing and printing, new applications of special finishes, and the development of new fibres and blends—all were becoming increasingly dependent on laboratory methods, research, and a knowledge of related sciences. The textile industry offered even greater scope for men and women with a sound professional and scientific training. Referring to the recent "remarkable performance" of British firms at the International Fabrics Exposition earlier this year in Sacramento, California, Mr. Erroll said that at the exhibition British exhibitors won no less than 38 gold medals out of a total of 87. This achievement, he pointed out, was a tribute also to British design, where we were sometimes unreasonably accused of falling behind. He was sure that technologists would also agree that however excellent from a technical point of view the construction or performance of a fabric might be, the right finish and design were essential for commercial success.

Referring to the traditional bag and sack-making industry which, although by no means confined to Dundee, had always been a considerable consumer of Dundee-made jute cloth, Mr. Erroll said technical change was responsible for the development of bulk handling and of alternative packing, so that the traditional sacks were not so widely required. Speaking more generally, technical progress might save costs and produce new products at a lower price, and thus give us renewed opportunities in the export markets of the world. There might however, be an economic price to be paid elsewhere in the form of manufacturing processes that were no longer needed and should be scrapped, and the transfer of workers to new factories and new industries preferably if it could be managed, within reach of their existing homes. For years we stayed in the lead drawing on our traditional skills and craftsmanship, and on our experience in factory organisation and in the design of textile machinery. Now other countries were developing powerful textile industries of their own and conditions for our textile industries had become increasingly competitive. The problems of adjustment, not only in Lancashire's cotton industry, but in a number of other industries, would have to be faced. But to try to stop this increased flow of manufactured exports from the newly developing countries would have disastrous consequences for the free world in the long run.

* * * *

COTTON PROMOTIONAL ACTIVITIES

To encourage major cotton growing and exporting countries to support programmes in market research and cotton textile promotion being carried out in various consumer markets throughout the world, the International Federation of Cotton and Allied Textile Industries recently submitted a statement to trade associations representing cotton growing and exporting interests, and appropriate government departments in over twenty countries. The Federation—whose members represent almost 66% of the world's cotton spindles and looms—noted that in 1958, cotton still accounted for 65% of all textile fibres consumed in the world, but cotton's percentage is slowly declining and it is also faced with increasing competition from other fibres. At the same time, textiles in general have fallen behind the rates of growth of many other consumer goods. It was also noted that the producers of man-made fibres, wool, silk, linen and jute are providing market research and promotion funds for their fibres five to ten times as great as those now being provided by the producers of cotton. Thus, the producers of fibres for two-thirds of the world's textiles

are being seriously out-distanced by the producers of the fibres for the remaining one-third.

The Federation point out that in the United States, the National Cotton Council operate programmes of market research, sales promotion and public relations to the order of about $1·4 million per year to stimulate cotton consumption. In addition, the U.S. cotton industry, with the help of the U.S. Department of Agriculture, supplies another $1 million annually for promotion through the Cotton Council International to cotton industry organisations in Austria, Belgium, Finland, France, Germany, Italy, Japan, the Netherlands, Spain, Switzerland and the U.K. The only other raw cotton producing nations supporting cotton promotion work outside their own borders, even in a limited way, have been the Egyptian Province of the United Arab Republic and the Sudan.

In the opinion of the Federation this co-operation by the U.S. and other producing countries with the processing industries is having a beneficial effect for cotton and for all phases of the textile trade by stimulating a greater interest by consumers in apparel and household products. This is one of the forces which promise a brighter future for all who produce, process and merchandise cotton. It is obvious, the statement continues, that the present level of international cotton promotion is not adequate and it is most important that cotton textile promotion should be promptly initiated in many markets where programmes do not now exist. In addition, the present co-operative programmes need to be made stronger and more effective. The producers of raw cotton all over the world have a direct interest and responsibility in these efforts to maintain and increase the consumption of cotton textiles. The Federation in recommending all raw cotton producing and exporting countries to study the present programmes of cotton promotion, also invites them to consider the possibility of participating financially and otherwise in these activities.

* * * *

SWEDEN A MARKET FOR PIECE-GOODS AND KNITWEAR

THE great potentiality of the Swedish market for Scottish knitwear and woollen piece-goods was emphasised by Mr. A. E. Wernley (secretary, British-Swedish Chamber of Commerce in Sweden) in a recent address to tweed and knitwear manufacturers in Hawick, organised under the auspices of the South of Scotland Chamber of Commerce. He emphasised the fact that the Swedish market did not consist merely of the main towns and fashionable shopping centres. The Swedish population of 7,500,000 was no true indication of the country's purchasing power. Taking the average spending power of the Briton as a little over £300, the Swedish comparison was over £500. In the north of Sweden there was tremendous purchasing power and an excellent market though the shops might not give the impression of a quality market. Mr. Wernley advised travel to the north by plane as a time-saver. To cover the territory right to the north, travel by road would be best. Britons going to Sweden on business should take their cars, or hire a car there. The rule of the road was as in Britain—driving on the left of the road.

Mr. Wernley pointed out that summer was the wrong time for a business visit to Sweden, and he was critical of holiday-business trips. The best time for business trips was from mid-September to mid-December, and the early spring up to the middle of May. These times gave the best chance of seeing business leaders. He assured firms that chambers of commerce at home, or his own organisation, would help in giving advice. In appointing new agents, the only sensible method was to go to Sweden for the purpose. They should not adopt the attitude that they were doing the agent a favour. They should consider that they were working on equal terms. Mr. Wernley stressed that Sweden must not be treated as a stop-gap market. It must be cultivated all the time, and not merely at times when America, or other markets, proved unproductive. The men who were sent to Sweden to cultivate the market must be men with power to make decisions; they should not have to go back to ask the authority of their boards. If they did, other countries would have stepped in and taken the order by the time a decision was reached. He indicated that the Swedish attitude to British goods was generally very favourable, though a section in the south was pro-German. Swedes, he said, still complained that there was a lack of promptness in Britain in answering correspondence; the Germans, on the other hand, answered promptly, if at great length. The Swedes themselves were much more inclined to use the telephone. It was absolutely vital to keep rigidly to delivery dates in dealing with the Swedish market. For knitwear goods, there was quite formidable competition in Sweden, but not so much so for quality woollen piece-goods.

* * * *

CAN WE CONTROL THE ECONOMY

WRITING in the *District Bank Review* about some of the instruments by which British economic affairs are managed Professor Carter first distinguishes four conflicting aims of policy. The commonsense attitude is, therefore, to decide which of these is the most important and to press forward policies which assist them to the greatest extent compatible with avoiding complications in other directions. Actually both Government and public find it difficult to decide which should receive priority, but in the writer's opinion we ought to concentrate on expansion and technical progress, limited only by an intention to keep the other problems from involving us in disaster.

By a process of elimination he arrives at the conclusion that the main instruments of management are those which produce variations in expenditure on capital equipment and in consumers' expenditure, and of these general credit policy is potentially effective, although the delays before it produces its effects make it undesirable to lean heavily on it as an instrument of control. In contrast hire purchase policy should be used gently because it acts with devastating suddenness. The objection to direct control of capital investment programmes is that they tend to disrupt economical planning of investment. Fiscal control is unsatisfactory because it is complicated, obscure and involves time-lags inseparable from an annual budget.

Although Professor Carter finds the purposes of economic policy are contradictory and only rarely is it possible to make one thing better without making another worse, this does not prove that we should be better off if we gave up the attempt to manage our economic affairs. It does suggest, however, the need for a humble and commonsense approach. Humility is needed because it is not at all certain we yet have the ability to maintain full employment, advancing incomes, a payments surplus and withstand inflation. Commonsense is required because enthusiasm for a single instrument of economic management is likely to cause sharp disappointment and so it is sensible to use several with moderation, but none to excess.

Catalysis and Activation of Bleach Liquors

Oxidation in bleaching textile fibres is a complex process and is influenced catalytically in various ways, some of which are outlined in this article

By "TECHNICAL CORRESPONDENT"

IT is noted by Munch[1] that the bleaching action of oxidising agents is due to their "active" or "nascent" oxygen and that these terms borrow their significance from the energy generated during the chemical reactions involved. Bleaching or whitening is the process by which oxidation of the organic impurities in the fibre are rendered colourless and soluble, for example, into substances like oxalic acid, or gases, such as carbon dioxide, ammonia or nitrogen, as when organic matter is intensively oxidised. Atmospheric oxygen as such has little or no oxidising power at ordinary temperature in the absence of water or some other catalytic substance, such as bacteria, light, metals, etc.

Bleaching is an exothermic reaction, that is, liberating heat and generating energy in the systems set up ordinarily by the presence of impure cellulose fibre in the bleaching solutions as normally constituted. During the bleaching process the energy potential of the system is lowered by decomposition of the liquor into other bodies of lower energy content, with resultant liberation of energy. This is the product of two reactions (*a*) production of active oxygen in the bleaching liquor by activation or catalysis and (*b*) oxidation of the textile impurities, so that the energy generated in the first promotes the progress of the second.

This energy has been measured in heat units or calories, as follows:—

Reaction (1) hypochlorous acid:
$2HC1O \longrightarrow 2HC1 + 2O + 18{,}600$ cals.
Reaction (2) hydrogen peroxide:
$H_2O_2 \longrightarrow H_2O + O + 23{,}100$ cals.
Reaction (3) ozone:
$O_3 \longrightarrow O_2 + O + 32{,}400$ cals.

Controlled Activation of Bleach Liquors

The literature of the subject reveals that in addition to the dangers of over-activation of bleach liquors some thought has been given to the controlled use of activation by the addition of known and minute amounts of iron and copper to suitable bleach liquors of hypochlorite and sodium chlorite. For activating sodium chlorite liquors, organic esters such as ethyl lactate and various chlorinated organic compounds, have been suggested, as well as acid, acid salts and aldehydes. The use of sodium hypochlorite is already well known and practised in this connection. In U.S.P. 2477631, claims are made for the use of small amounts of water soluble salts of cobalt, nickel or manganese, as catalysts or activators for controlling the activity of the bleach liquor. As the activity of the bath depends more upon the presence of the requisite amounts of metal salts, and not upon the acidity of the solution, the pH value of the liquors is maintained within the limits of 7 to 8.

Catalytic Action of Organic Substances

The following extract from a paper by Campbell[2] may throw some further light on the valuable catalytic properties of certain organic substances: "We may mention here certain organic substances, such as turpentine, which can ultimately be classed with the oxidising bleaches, in that they are able to bestow an apparent activation on elementary oxygen, and thereby effect a certain degree of bleaching. These substances among which turpentine and methylhexalin may be specially mentioned can, under certain circumstances, combine with a molecule of oxygen with formation of labile organic peroxides which readily lose their oxygen again in activated form. This effect is evidenced by the bleaching of the lower part of the cork of a turpentine bottle. Such materials are sometimes added before a kiering in order to effect in the kier a preliminary bleach. Nothing is known as to the energy liberated in the decomposition of these labile peroxides. Their liberation of iodine from potassium and iodide solution is no criterion of their effect on textile impurities, which are more difficult to oxidise."

Ultra Violet Light in Bleaching

In a note on this subject (reference untraced) attention is drawn to the fact that UV light has a valuable use in bleaching processes when used as an activator. Generally speaking in mild or warm climates the normal temperature of bleach liquors is sufficient to bring about activation when using hypochlorites. In very cold climates, however, the temperatures of the liquors is so low that bleaching action is very slow and heating has to be used. In some cases it is claimed that artificial UV light, which is uniform and controllable, can be used more cheaply and effectively than heat for the purpose of activating hypochlorite bleach liquors.

Activation of Hypochlorite Liquors

Kauffmann and others have explained the function of activators in bleach liquors. For example, in a hypochlorite liquor the oxidising agent is the hypochlorite ion and the activator the hypochlorous acid. An early explanation of the tendering action of hypochlorite liquors was that if hypochlorous acid is formed in each hypochlorite bleaching liquor according to the equation:

$NaOC1 + H_2O = NaOH + HOC1$

then fibre damage increased in proportion to the amount of hypochlorous acid; as the pH increased the degree of fibre damage decreased, this would seem to confirm the foregoing conclusion. On the other hand,

experiments show that hypochlorous acid itself has little or no damaging action on the cellulose fibres. As a result of investigation along these lines it has become clear that hypochlorous acid plays the part of activator in a hypochlorite bleaching liquor.

Other substances may, and do, act in a similar manner—e.g., hydrogen peroxide, which gives excellent results. Ammonia is also a good activator but acts in a secondary manner by the prior formation of chloramines. Acid amides and amino acids are other examples as, for instance, urea which forms di-chlor urea and this in turn activates the hypochlorite solution. In the latter case if the activator is exhausted the bleaching solution becomes almost inert.

Chemical decomposition of hypochlorite takes place as follows:—

(1) $NaOCl = NaClO_3 + 2NaCl$

(2) $2NaOCl = 2NaCl + O_2$

It is known that these reactions are accelerated by light and heat. (1) is the main reaction but (2) is also present and is activated by metallic impurities and other catalytic substances. Stock solutions of hypochlorites are known to keep better in concentrations of 30% to 35% chlorine rather than in 40%—50% strengths. They should also be kept under cool conditions and protected from light, dust and air, to minimise decomposition.

Sodium Hexametaphosphate as Activator for Chlorine Bleach

The following extract from J.S.D.C. Sept. 1948, p. 327, is an illustration of a milder type of activation of bleach liquors for a particular purpose:—

"*B.P.* 601645: A better bleach and stronger fibres are obtained by treating cellulose fibres, particularly retted fibres for a short time in aqueous solution containing 1—4 g. of active chlorine per litre at pH $<$ 3 and 20°C., then, with or without rinsing, in aqueous sodium hexametaphosphate or sodium sulphamate at 20°C., the liquor being maintained at pH 10·5—11·5 by additions or sodium carbonate, and finally in an aqueous solution containing 0·5—2·5 g. of active chlorine per litre at pH $<$ 3."

The value of this treatment seems to lie in the alternation of low pH and high pH combined with a mild activation of the bleach liquor by sodium hexametaphosphate of sodium sulphamate. It has been noted in practice that ordinary hypochlorite bleach liquors are noticeably activated in the presence of small amounts of sodium hexametaphosphate and the bleaching process can be considerably speeded up by its use.

Bromine as Catalyst in Bleaching

Because hypochlorites are the cheapest and most effective bleaching agents known, continuous thought is being given to their use from the economical point of view. For example, it is disclosed in B.P.596192 and 596193 that bromine, as well as being a strong oxidising agent itself, has also an activating effect on acid or alkaline hypochlorite bleach liquors. The main effect here is to double the rate of bleaching when added to hypochlorite liquors and the net result is that less hypochlorite can be used, thus minimising the risk of fibre damage. The bleaching process can be carried out at a pH range of 7·0—8·2 without overbleaching instead of pH 10—11 for the slower method without bromine.

An example used a sodium hypochlorite liquor containing 0·7 to 0·8 grammes/litre of active chlorine (approx. 50% less than usual) and 0·3 grammes/litre potassium bromide. About half of the chlorine is used up in 15 mins. and this is replaced by a regulated amount of hypochlorite. Bleaching is continued for 60 mins. By such methods it is thought that it may be possible to devise processes of continuous hypochlorite bleaching with a minimum risk of fibre damage by over-oxidation.

Peroxide Bleach Liquors

Lorenz[3] in an article on peroxide bleaching of rayon draws attention to the fact that copper and iron have no decomposing effect on acid solutions of hydrogen peroxide, as compared with similar alkaline solutions. It is also noted that a standing bath of peroxide may be quite stable, yet in the presence of fibrous material, such as rayon, bleaching activity is marked. It is further pointed out that rayon will give rise to much more rapid decomposition of the bleach bath than cotton.

Effect of Rayon on Hydrogen Peroxide Bleaching Baths

As already noted peroxide bleaching baths are much more rapidly oxidised in the presence of rayon than the same bath in the presence of cotton. So far as the writer is aware the reasons for this have not been precisely outlined, but the micellar hypotheses of Turner[4] noted elsewhere may be part of the explanation, as it is known that in the manufacture of viscose rayon a lateral reorientation of the micelles in the cellulose molecule takes place. So far as the stability of the bleach bath in the presence of cotton is concerned it is now well known that impurities in grey cotton have a very marked stabilising effect on oxidising liquors, indeed to such an extent that a one-stage peroxide bleach for cotton can be, and is, successfully carried out under pressure at 200°F. in suitably prepared kiers. So far as rayon is concerned the general conclusion is that for rayon bleaching a lower degree of alkalinity can be safely used in the presence of sodium silicate alone as stabiliser without any other alkali.

Reduced Catalytic Effect in Continuous Peroxide Bleaching

In a paper on continuous peroxide bleaching Bell[5] draws attention to the two main factors which contribute to the higher efficiency of this method. It is claimed that

(1) Lower the liquor ratio and more effective the bleach,

(2) With a low liquor ratio the proportion of total peroxide used in bleaching increases and the proportion of loss by catalytic action and as residual peroxide is also smaller.

It is also claimed that the total bleaching time, including alkali scour and peroxide bleach, is reduced by lowering the liquor ratio; from a total of 8—16 hours, to 1—2 hours, largely because of the mass action of chemicals in concentrated solution in intimate contact with the fibre.

From the present point of view of catalytic action it is plain that this will be very considerably reduced because of the fact that the goods are simply saturated with the concentrated solutions required for scouring and bleaching and, therefore, the risk of contamination of the bleach liquor by minute traces of metals is proportionately reduced. In other words, a smaller amount of liquor will contain a smaller proportion of possible causes of catalytic action in the form of metallic impurity. On the other hand, if the catalytic impurity is already present in the fibre, for example, as in oil stains, which may contain minute traces of iron or brass from machine bearings, the danger of catalysis may be increased rather than diminished, due to the presence of much larger amounts of oxidising agent in close contact with the fibre.

As a further commentary on this aspect of the subject it should be noted that in a winch machine the ratio of

water to goods is generally 30—40 to 1, in a package machine 8—12 to 1, in a bleaching kier 4—6 to 1, and in the case under discussion of continuous J-box bleaching the proportion of water to goods is 1 to 1, and it is to this latter factor more than to any other that the high efficiency of the process is attributed.

Sodium Perborate Bleach Liquors

Sodium perborate as a bleaching agent for small quantities of goods has several advantages, as it is easily controlled in action, because of its mild alkalinity and consequent high stability. The chemical action of perborate in bleaching corresponds to the following equation:

$$4NaBO_3 + 5H_2O = 4H_2O_2 + Na_2B_4O_7 + 2NaOH$$

Sodium perborate — Water — Hydrogen peroxide — Borax — Caustic soda

The critical temperature of bleaching is about 95°F., above which the perborate will decompose rapidly; also if for any reason the bleach liquor becomes more alkaline, oxygen is released at a very high rate.

In treating goods which may carry alkali into the bleach bath, such as scoured wool, the bleach liquor can be set with a small addition of sodium bicarbonate or tri-sodium phosphate which act as alkali binders. Again, in some cases the bath is made weakly acid with sulphuric acid or hydrochloric acid, which are then balanced by the weak borax alkalinity of the perborate solution. As with all other bleaching solutions the presence of metal, such as iron, copper, manganese, etc. in even very minute quantities will result in rapid activation of the bleaching liquor and loss of oxygen, with possible tendering of the material.

Effect of Various Metals on Stability of Peroxide Liquors

Observations of some interest have been made by Campbell[2] regarding the activity of different metals in peroxide bleaching baths. Iron is most commonly encountered both as an impurity in plant water and in equipment, but it is stated not to be nearly so active as some other metallic ions, such as copper, manganese and cobalt. On the other hand, it is noted that these three are rarely encountered as impurities in water, which is fortunate, there is no known method of inhibiting their catalytic properties. Copper, even in the most minute traces, is a very active decomposition catalyst, and equipment in which the bleach liquors come into contact with any exposed copper should be rigorously excluded. The following extract from the same source will give some indication of the possible uses of the various metals for bleaching equipment:—

"Nickel is not an active catalyst and containers of this metal can be used. Monel metal apparatus is quite widely used for bleaching equipment, particularly in the hosiery industry. This material increases the rate of decomposition and, as a rule, fairly rapid bleaching takes place. Stainless steel of the general type containing 18% chromium and 8% nickel makes an excellent material for the construction of bleaching equipment, as it does not materially affect the stability and is not corroded by alkaline peroxide solutions. Lead is used to some extent for equipment, but it must be kept coated with silicate or in baths containing sulphates, a coating of lead sulphate is formed. If it is not coated, an accelerated decomposition will result and the goods may be stained. Aluminium is used to some extent and where the baths contain silicate it seems to be giving satisfactory results. Wooden tanks, after they have been used once or twice, do not have any effect on the stability of the peroxide bath and are, therefore, satisfactory."

As already noted elsewhere there are different opinions about some of these remarks, for example, it has already been noted that nickel and monel metal both may cause trouble under alkaline bleaching conditions. Exception might also be taken to the inclusion of aluminium in this type of work, as the use of the equipment is limited by the degree of alkalinity required for either scouring or bleaching processes.

The author (Campbell) quoted above also notes the valuable part that sodium silicate plays in inhibiting the effect of iron, because of its property of forming a metallic complex compound which is not ionised in solution and is, therefore, much less active than if it were in the form of either ferrous or ferric hydroxide. The valuable property of silicate in forming thin films on metallic surfaces is also noted, and the use of this effect for coating the walls of iron kiers has already been dealt with elsewhere. Incidentally, from experience in scale formation in shell boilers, such as Lancashire boilers, it is well known that very small amounts of silica hardness in water are sufficient to form a thin, adherent and very hard scale on the metal surface. For this reason it is important when coating the walls of iron kiers to ensure the metal is scraped as clean as possible before the coating is applied, so that close contact with metal and silicate is ensured.

In a discussion of the effect of iron on catalytic decomposition of peroxide liquors Rupp[6] points out that, in the first place, there does not seem to be any adequate explanation of the effect of iron. Secondly, this writer states that experiments have been made by twisting pieces of iron wire into the cloth and the only result has been a rusty stain without any tendering at the places affected. On the other hand, it is known that as little as 0·01% of iron in fabric will bring about severe damage to cellulosic fibres. It is further suggested that it may be the presence of some other impurity in the iron compound is the real cause, but only extensive investigation would confirm this theory.

It is suggested by Turner[4] that when traces of iron acted in a catalytic manner to increase oxidation, the metallic compound generally changed from the ferrous to the ferric state in the process. It was further suggested that a possible hypotheses for the different degrees of oxidation was that in the case of very rapid oxidation the micellar surface of the fibre reacted, while at other portions of the cellulose molecule the oxidation process was much slower.

Comparative Effect of Iron and Copper in the Decomposition of Peroxides

Comparative figures for the decomposition rates of peroxide solutions brought about by traces of iron and copper are given by Laporte,[7] and it is stated that one part per million of iron or as little as one-twentieth of a part per million of copper can bring about very rapid decomposition of peroxide solutions. *Illustration*: It is shown that the loss for 35% solution of hydrogen peroxide in the presence of one part per million of iron can be rather more than 4% at 100°C. in three hours. Under the same conditions one part of copper in 20 millions will bring about a loss of 16%. The foregoing figures are for unstabilised solutions. For stabilised solutions the comparative and respective figures would be iron ·2%; copper 2%, loss of peroxide in three hours at 100°C.

Effect of Iron at Various pH Values

A study of this aspect of the subject has been made by Wood and Richmond[8] who report on the rate of decomposition of hydrogen peroxide in the presence of an iron salt and the different pH values of the solution. These authors point out that pure high-strength solutions of hydrogen peroxide are normally very stable over the pH range 2 to 7, even at temperatures up to 100°C., and below pH 6 the rate of evolution of oxygen is quite small with very little variation at this temperature. It was formerly thought that the presence of a small amount of acid was required to maintain stability of this order, but it is now known that if the product is pure, stability is high.

From the point of view of the presence of small quantities of iron of the order of 0·1 parts per million, it has been shown that even with high-grade pure hydrogen peroxide the rate of decomposition is very noticeably increased by comparison with the same material in the absence of iron. For example, the highest rate of decomposition was noted at pH 3 which was more than four times the decomposition rate at pH 4. These figures, of course, refer to high-strength peroxide at 100°C., but it can be concluded that the same principle would apply for dilute solutions in the presence of minute traces of iron or other metals.

The writers quoted also draw attention to the fact that the old simple conception of the direct decomposition of peroxide or hydrogen peroxide into a molecule of water and an atom of oxygen has now given way to a more complicated series of reactions. It is known that hydrogen peroxide and other peroxy compounds form free radicals (HO_2) and (OH) in their systems, and it is suggested that the bleaching action could depend on these rather than on the oxygen itself.

Effect of Copper on Hypochlorite Bleaching Solutions

In an interesting discussion on the effect of copper on hypochlorite bleaching solutions, in a textile journal of a former era (*Col. Trade Jnl. and Tex. Chem.*), the author has some interesting remarks. Some of the machines in question of that era were lined with copper, and structural parts of phosphor bronze and it became known, as the result of practical experience, that such machines did not give good results when using either calcium or sodium hypochlorite for bleaching. The latter being much more alkaline was found to be the more dangerous of the two, not only by reason of the small amounts of copper dissolved and carried into the bleach liquor, but also from the point of view of the production of stains on the yarn. Calcium hypochlorite was not so difficult, because of its reduced alkalinity, as compared with the sodium salt, and it was also noted that the bronze portions of the machine did not react to the same extent as the copper lining. Another observation was that when soap solutions were used in the machine a bluish green deposit was formed on the bronze structural portions, this deposit tended to get on to the skeins of yarn and bring about staining and localised tendering.

The article goes on further to discuss the use of monel metal which is a natural alloy of nickel and points out that though the risk may be lessened, it is by no means eliminated and that there are conditions under which a black oxide of nickel may be formed, which can give rise to stains and catalytic action in much the same manner as already discussed. The foregoing notes are of interest, not so much with reference to the type of machine mentioned, which today are made of stainless steel with elimination of the risks aforementioned, as to draw attention to the danger of the use of hypochlorite in copper vessels or indeed any equipment where bleaching solutions are coming into contact with metal parts other than stainless steel.

Kier Treatment for Protection against Iron

The subject of catalytic action on bleach liquors would not be complete without some reference to methods of protection from metals, one of these is as follows: In kier bleaching the main risk is contact with the iron walls of the kier which must be insulated by a protective layer. A suitable mixture is a paste made of 4 lbs. Portland cement, 1 lb. lime, 1 lb. magnesium oxide. This mixture is pasted with sodium silicate at 20° Tw. to a creamy consistency. Apply with a brush and allow to dry for at least 24 hours and then circulate a kier full of liquor containing 40 lbs. silicate of soda, 10 lbs. caustic soda, 6 lbs. lime, 5 lbs. magnesium oxide. This liquor is circulated at the boil for eight hours or more. Allow to cool again and set overnight. This liquor is also excellent for the formation of a protective layer on the circulating system and pump.

Influence of Dyes on Oxidation of Cellulose

That certain dyes had an accelerating effect on the oxidation of cellulose was one of the main points in a lecture by H. A. Turner,[4] who pointed out that there was in such cases a third substance involved in the reaction, such as a reduced vat dye which often acted in this way. Again, it was noted that the presence of oxalic acid, for example, produced rapid oxidation in discharged indigoes and on material dyed with chrome colours. To these facts should be added the observation that dyes which have been after-treated with copper or other metals should never be peroxide bleached, in view of their known reactions in producing a rapid decomposition of the bleach liquor, with possible tendering of the fibre. It is stated by Patel[9] that in some cases complete destruction of the material may occur.

REFERENCES

(1) Munch: Principles underlying Bleaching by Oxidation. Dyer and Cal. Printer, Apl. 15, 1930, p. 479.
(2) Campbell: Peroxide Bleach Baths. Amer. Dye. Rep., Feb. 10, 1936, p. 67.
(3) Lorenz: Rayon Bleaching with Peroxide. Monatschraft, May, 1934 (through Dyer and Tex. Printer, Apl. 12, 1935, p. 379).
(4) Turner: Some Aspects of the Oxidation of Cellulose. Dyer and Tex. Printer, Apl. 12, 1935, p. 385 (report of lecture).
(5) Bell: Chemistry and Practice of Continuous Peroxide Bleaching. Tex. Age, June, 1953, p. 30.
(6) Rupp: Bleaching Cotton Piece Goods with Hydrogen Peroxide. Dyer and Tex. Printer, Dec. 20, 1935, p. 585.
(7) Laporte Chemicals Ltd.: Manufacturers' Booklet on Hydrogen Peroxide, pp. 9 and 10.
(8) Wood and Richmond: Bleaching with Hydrogen Peroxide. Jnl. Soc. of Dyers and Col., Sept., 1952, p. 337.
(9) Patel: The Peroxide Bleach. Tex. Col., Dec., 1936, p. 835.

NYLON'S OVERALL ADVANTAGES. This is the title of a booklet published by British Nylon Spinners Ltd., Promotion Department, 68 Knightsbridge, London, S.W.1. It contains much data designed to help intending purchasers. One section sets out the basic properties of the nylon fabric used for the majority of the nylon overalls currently being produced. Another describes the ways in which nylon work clothing can improve efficiency and reduce costs. Elsewhere details are given of the correct method for washing nylon overalls in laundries, in washing machines or by hand. Information is also given about removing stains. In addition factual examples of the successful use of nylon overalls in various industries are also quoted.

* * *

HIGH CAPACITY ROLLER BEARINGS. A new publication from Pollard Bearings Ltd., Ferrybridge, Knottingley, Yorks., tabulates the complete range of "Mak-Lead" bearings, giving all relevant dimensions, weights, working load ratings and the basic reference numbers of American made bearings to which Pollard bearings correspond. Also included in this particularly well designed catalogue are bearing selection details, conversion graphs, details of bearing location, alignment, retention, and seals.

Organic Pigments* on Textiles

By Dr. F. M. SMITH†

DR. SMITH quoted American figures to illustrate the relative productions of dyestuffs and pigments. These show a ratio of about 3 to 1, dyes to pigments, but with the pigment proportion steadily increasing owing to the expansion of non-textile applications and the increasing use of pigments in textiles.

A pigment is insoluble in the medium for which it is used whereas a dyestuff is applied by a process involving solution. For this reason the physical characteristics of a pigment particle are much more important than those of the dye. Dr. Smith illustrated the formation of pigment particles during manufacture and their build up into large agglomerates which are subsequently broken down again by dry grinding. Methods of dispersing pigments including modern high speed equipment such as the Kady Mill were reviewed.

The importance of the physical characteristics of a pigment was illustrated by the severe flotation of blue and white pigments in paints made from phthalocyanine blue and titanium dioxide. This could only be overcome completely by modifying the blue pigment. The Irgalite SPV aqueous pigment dispersions for emulsion paints which colour by stirring in were also described.

Inorganic and organic pigments were compared and contrasted; although natural inorganic pigments were very fast to light, like the synthetic inorganic pigments they usually suffered from some chemical defect which would result in break down through the action of acid or sulphur dioxide for example; carbon black and titanium dioxide are however chemically stable and very extensively used. By comparison with the coloured inorganic pigments the organic colours possess very much greater strength coupled with brilliance of shade. The various groups were differentiated: lakes, toners, azo pigmentary, basic dye complexes, phthalocyanine and vat colours. The vat colours are derived from the corresponding dye form, but do not necessarily give the same fastness properties.

In textile printing the share between pigments and dyes seems to be variable from one country to another but it is doubtful if pigments take more than 50%. They do, however, replace some of the more expensive dyes and they are particularly useful for padding solid shades on mixed fibres where difficulties with dyestuffs are encountered due to differing affinities of the fibres. One of the main difficulties is that in order to maintain the good handle of the fabric often sufficient resin binder cannot be used to give complete protection to washing or to dry cleaning. It is generally considered that there will be a fierce battle between dyestuffs and pigments during the next five years.

Pigments are being used extensively for the mass colouration of artificial fibres. The largest quantity used is in the spin dyeing of viscose rayon where very finely dispersed pigments in aqueous suspension are made into a master batch with viscose solution and injected into the main viscose supply before spinning. Obviously pigment particle size must be extremely small in order to avoid blocking the very fine holes in the spinneret otherwise repeated breakages in the yarn occur. Manufacturers of these pigment dispersions are now able to produce dispersions in which practically all the particles are below 1 micron in size and none is greater than 2 microns. This is leading to much improved and trouble-free spinning. Obvious advantages are cheaper processing by comparison with dyeing, better fastness properties and brighter shades.

Acetate rayon can also be mass dyed very readily by the use of pigments, the pigment being incorporated in the form of cellulose acetate chips or, in some cases, being added as an aqueous dispersion. Non-bleeding in the solvents used is, of course, essential.

Spin dyeing of the newer synthetics is more difficult since more powerful solvents and higher temperatures are often necessary. The high temperatures involved in melt-spinning of nylon etc. are such that very few organic pigments can be used, phthalocyanines and vats being the most likely.

In conclusion Dr. Smith pointed out that increasingly stringent conditions were being imposed on pigments in high temperature processing of plastics and synthetic fibres for example. Thus, although the pigment industry was an expanding one it had no cause for complacency and continuous development and research work was in progress for the production of better pigments for existing and new applications.

* *Abstract of paper given to the Rochdale branch of the Guild of Calico Printers.*

† *Geigy Co. Ltd.*

Versatile Unit-Constructed Work Table

THE unit-constructed work table (illustrated) has been designed by Farrow and Jackson Ltd. (Materials Handling Division), 41-2 Prescot Street, London, E.1, for use throughout all types of industry. Made with square tube legs that have a slight radius on the edges and with a hammer finish paint, it is both strong and easy to clean, there being a minimum number of dust traps. The tops are available in a variety of materials according to requirements. Basic units consist of top, end leg and centre leg sections, bracing bars, screws and bolts, which are supplied in any combination required and a few minutes suffice for the erection of a single unit. Additional sections can be purchased at any time.

The sections may be bolted together, end to end, side by side, to form any working area necessary and in so doing provide a really strong and stable unit, each individual unit being 2 ft. 9 ins. square by 2 ft. 9 ins. high. Adjustable feet are fitted to allow for inequalities in the floor. Where seasonal changes call for constant change in floor layout these units will be found to be most flexible whilst providing extreme strength. Broken down, they require a minimum of storage room. Tops too, can be re-made, where certain types of work being carried out provide unusual wear and tear.

The Farrow and Jackson unit constructed work table

A New Class of Spun Yarns

ORMEROD BROS., well-known Brighouse spinners, and a subsidiary of Brocklehurst-Whiston Amalgamated Ltd., announce the introduction of the Spunloft range of yarns, which are said to possess bulk and stretch properties to an extent never before obtained with spun yarns. Spunloft is the registered name for long staple spun yarns given greatly increased powers of bulking by processes which are the outcome of an intensive programme of research, development and assessment. It is a true stretch yarn and fabrics made from it differ fundamentally from those sometimes described as spun/stretch and which consist of an orthodox singles spun yarn combined with a continuous filament stretch yarn either by folding or plating during knitting.

This latter type of fabric represents a compromise adopted to meet the desire, particularly of half-hose knitters, to increase the thickness, resilience, and cover of textured continuous filament fabrics. Using an orthodox singles spun yarn has the desired effect on handle but has the drawback of poor resistance to felting and pilling during washing and wear.

Although the logical answer is to use a two-fold spun yarn, the development of such is not an easy matter because continuous filament techniques cannot be applied to spun yarns for either technical or economic reasons. Spun yarn is also a more costly raw material than flat untwisted filament yarn so that the cost of additional processing must be low if the final price is not to be prohibitive.

Like the continuous filament type, some form of relaxation is necessary for the yarn to assume its elastic form. Any of the usual methods can be used, such as dry heat, steam heat, or warm water. The geometrical form of the relaxed yarn is shown in Fig. 1 (a photomicrograph of 2/60s worsted spun nylon yarn before and after treatment). The transformation could not be more marked; it assumes the form of a tightly coiled spring. This helical configuration is the reason for the very high stretch properties and the recovery from stretch is also excellent. The process has been applied to nylon, "Terylene," and the acrylic yarns, alone and in combination with wool. A striking feature is that a 100% wool yarn with excellent stretch properties can be produced for what is believed to be the first time.

Spunloft yarns are also available in combination with singles continuous filament textured yarns. This is a particularly interesting combination because, although the continuous filament component itself does not increase the stretchability in any way, as Fig. 2 shows, it does reduce the cost slightly, lends itself to the production of marl dyed effects, and also contributes to the very satisfactory resistance to pilling and felting. A feature of the process is that dyed yarns cost very little more than undyed. Spunloft yarns are intended for uses where their fullness, resilience, and different handle will represent a welcome extension of the range of stretch fabrics. Examples are half and three-quarter hose, gloves, knitted outerwear, etc., and in the heavier counts they will also be suitable for carpet manufacture and woven or knitted pile fabrics.

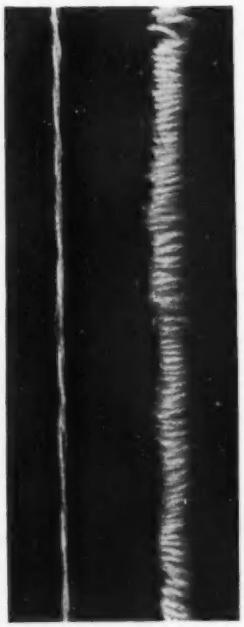


Fig. 1
This photomicrograph shows a 2/60s worsted spun nylon yarn before (left) and after (right) "Spunloft" treatment

Fig. 2
Photomicrograph showing the effect of combining a textured filament yarn with a "Spunloft" yarn (left) and with an orthodox spun yarn (right). In this combination the "Spunloft" yarn is the major stretch component and the textured yarn is wrapped round it as an effect thread. In the orthodox yarn combination the textured component provides the stretch and its shrinkage pulls the spun yarn into loops

Modern Cotton and Rayon Furnishings

The seven beautiful cloths on the facing page are fine examples from the range of quality products manufactured by Lawrence Cotton Ltd., Fernhurst Mill, Blackburn. Superbly woven and finished they represent remarkable examples of British value in textile fabrics.

(1) A rich background sheen, reflecting the light in a most attractive manner, is imparted by a wine-coloured filament warp. The matt gold weft brings the design into clear relief.

(2) Brilliant red filament warp provides the perfect ground for another striking design brought out by a white weft.

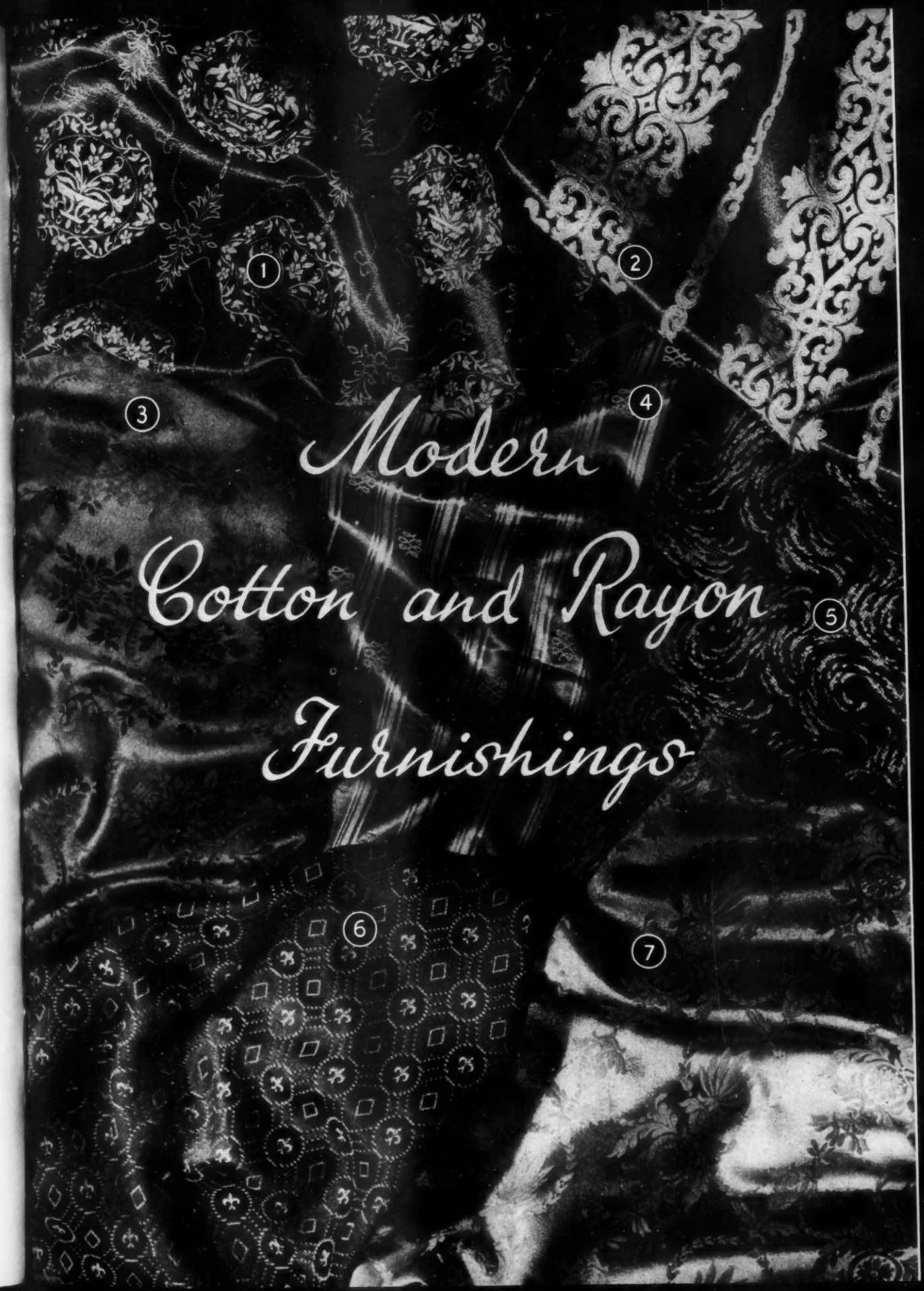
(3) A fine example of two-toned subdued lustre. Fine yarns both ways give quality and character to this lovely jacquard cloth.

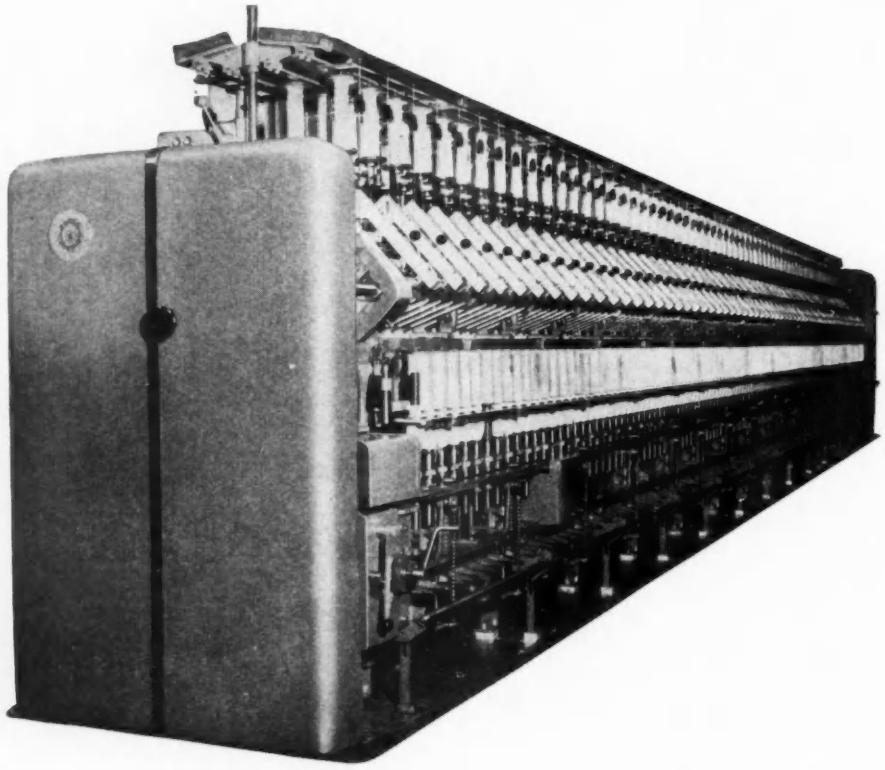
(4) Light green and pale yellow filament warp is an ideal combination for the neat figured effect made by the cream weft.

(5) A striking contemporary design in which a bright canary weft shows to maximum effect on a fine black cotton warp.

(6) A distinctive pattern composed entirely of folded yarns, crimson being the warp and cream the weft.

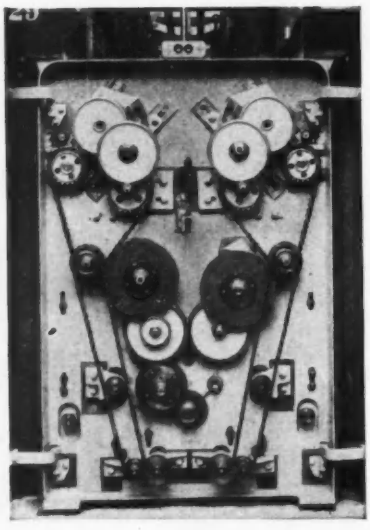
(7) Pale green filament warp provides the lustrous setting for the very artistic jacquard design in matt green.


1
2
3
4
Modern
Cotton and Rayon
5
Furnishings
6
7



For quantity and quality

Renold Chain Drive installation on the Megaflex High Draft Spinning Frame.



The established field for chain driving in the highest classes of textile machinery owes much to the eighty years of precision chain development by Renold Chains Limited. Modern textile machinery design is keeping pace with the demand for greater output and high quality of product; operational accuracy in related motions is essential — and is ensured by

RENOLD

chain drives

RENOLD

RENOLD CHAINS LIMITED · MANCHESTER

T.K.P. Sizing in Sacking Manufacture

Trials on sizing of sacking warp yarns composed of commercially used blends of jute, mesta and root cuttings reveal that the warp breaking strength increases on application of size in the concentration range 0·5 to 3%

K. K. CHATTERJEE, M. C. MAJUMDAR, A. K. GUHA and P. K. SAHA*

SIZING warp yarns—a long-established practice in the textile industry—enables the yarns to withstand the various stresses to which they are subjected in weaving, by providing the yarn with a protective coating and also binding the projecting surface fibres into the body of the yarn. Tamarind kernel powder (T.K.P.) is now almost exclusively used as a sizing material in the jute industry in place of starches. In Indian jute mills, size is applied to hessian warp only, sacking warp yarns are not generally sized but are only dampened with water during beaming mainly due to economic factors. Macmillan and Chakraborty[1] and Das, Guha and Wareham[2] have studied the quality of hessian warp yarn after T.K.P. sizing.

The quality of jute goods in general and sackings in particular has deteriorated during the last few years. This may be due, among other factors, to the larger proportion of inferior quality jute, root-cuttings and substitute fibres, etc. in the batch. In this respect sackings have been more affected than hessian. It was therefore thought that sizing of sacking warp yarns would improve its quality and show better performances in weaving. With this end in view, the present investigation has been undertaken to study the effect of sizing on sacking warp yarn quality (strength), warp breakages in the loom, fabric strength, loom droppings, etc.

Sacking warp yarns were spun from commercial fibres using average jute mills batch consisting of 25% bottom, 25% x-bottom jute, 25% mesta bottom and 25% root cuttings. Jute and mesta were first sampled and mixed thoroughly, sprayed with 35% emulsion and stacked for 2 days whereas rootcuttings were treated with 45% emulsion and stacked for 7 days. After that, the fibres were processed and spun as usual on the same set of jute machinery as used in T.R.L. standard spins[3] into yarns of two varieties—one with nominal grist of 11 lbs./spyndle and the other 9·5 lbs./spyndle—at 4 t.p.i. in both the cases. The weft yarns were spun into 30 lbs./spyndle yarns from commercial samples consisting of 50% cuttings, 25% x-bottom jute and 25% thread and rove waste with the same dollop, drafts and doublings, etc., as commonly done in jute mills.

* *Technological Research Laboratories, Indian Central Jute Committee, Calcutta* 40.

Sizing Ingredients

The sizing ingredients used were Tamarind kernel powder, soda ash, formaldehyde and water to make a total volume of 100 gallons. Experiments were carried out at different concentrations of T.K.P. (0·5%, 1%, 2%, 2·5% and 3%) keeping the concentrations of soda ash (·05%) and formaldehyde (about ·05%) constant. The usual technique in preparing size

Table 1

Concentration of size Estimated (oven dry) %	Viscosity of size. Time of flow at 25°C. (hr.-min.-sec.)	Period of boiling (hours)	Temperature in sowbox (during application) °C. ± 2°	WARP YARN QUALITY					Gain in strength % Mean		Size take-up Estimated (oven dry) %	R.H. %		No. of warp breaks in loom per 30 yds. weaving	Loom Caddies (gms.)	FABRIC QUALITY					
				Unsized		Treated		P.C. gain in strength	85°C.	65°C.		At Sizing	At Weaving			Porter	Shots	Width (in ins.)	Oz./ Sq. yd.	Breaking strength Warp (lbs.)	P.C. Gain in strength
				Grist lbs./ spynd.	B.S. (lbs.)	Grist lbs./ spynd.	B.S. (lbs.)														
With water only			31	10·8	7·4	10·3	7·8	—			—	63	64	31	79	5·5	7·4	27·3	16·4	430	—
With water only			33	9·7	6·6	9·4	6·9	—			—	63	59	28	80	5·4	7·7	27·6	15·7	423	—
0·55	0-0′-44″	½	83	,,	,,	10·2	7·6	15·2			0·63	71	68	16	67	5·4	7·6	27·4	15·1	426	0·7
0·55	,,	,,	63	,,	,,	9·7	7·6	15·2			0·62	66	65	18	56	5·5	7·4	27·6	15·7	418	—
0·57	0-0′-45″	1	83	,,	,,	9·7	7·3	10·6	12·6	15·6	0·62	67	66	12	50	5·5	7·4	27·4	15·3	430	1·7
0·58	,,	,,	63	,,	,,	9·4	7·5	13·6			0·70	66	62	14	59	5·3	7·5	27·5	15·5	419	—
0·55	0-0′-42″	2	83	,,	,,	9·7	7·4	12·1			0·64	66	61	11	64	5·5	7·5	27·5	15·2	440	4·0
0·55	,,	,,	63	,,	,,	9·8	7·8	18·2			0·61	65	63	13	54	5·5	7·3	27·6	15·5	460	8·7
1·08	0-3′-17″	½	63	,,	,,	10·6	8·0	21·2			1·17	68	63	8	50	5·4	7·6	27·7	16·0	455	7·6
1·01	0-3′-39″	1	83	,,	,,	9·5	8·0	21·2	17·4	19·6	1·08	63	58	6	40	5·5	7·7	27·5	15·5	510	20·6
1·03	,,	,,	63	,,	,,	10·3	8·0	21·2			1·09	64	61	7	44	5·5	7·5	27·7	15·3	459	8·5
0·98	0-3′-12″	2	83	,,	,,	9·4	7·5	13·6			1·11	59	45	6	50	5·5	7·4	27·5	15·5	488	15·3
1·02	,,	,,	63	,,	,,	10·0	7·7	16·6			1·00	58	49	6	40	5·5	7·3	27·6	15·3	458	8·3
2·06	1-2′-38″	½	83	,,	,,	10·0	7·8	18·2			2·03	35	30	4	40	5·6	7·3	27·3	16·2	476	12·5
2·04	,,	,,	63	,,	,,	10·2	7·9	19·4			2·03	31	34	4	38	5·5	7·5	27·7	15·8	479	13·2
1·95	—	1	83	,,	,,	10·6	8·5	28·8	23·2	25·2	2·04	55	49	6	40	5·5	7·4	27·4	15·7	513	21·3
1·95	—	,,	63	,,	,,	10·5	8·6	30·3			1·90	53	45	5	36	5·5	7·5	27·6	15·9	506	19·6
1·93	—	2	83	,,	,,	9·5	8·1	22·7			2·05	57	44	5	40	5·5	7·5	27·3	16·7	522	23·4
1·92	—	,,	63	,,	,,	10·3	8·3	25·8			1·95	56	51	6	32	5·5	7·6	27·7	16·3	500	18·2
2·47	2-36′-26″	½	83	,,	,,	10·8	8·7	31·8	31·8	28·8	2·35	54	54	8	36	5·6	7·2	27·5	15·5	527	24·6
2·47	,,	,,	63	,,	,,	10·6	8·5	28·8			2·47	59	54	8	36	5·5	7·5	27·8	16·3	522	23·4
3·11	9-2′-30″	½	83	,,	,,	10·2	8·7	31·8			3·13	52	46	6	30	5·6	7·4	27·4	16·7	541	27·9
3·07	,,	,,	63	,,	,,	10·3	8·6	30·3			3·29	56	44	6	30	5·5	7·5	27·6	16·8	547	29·3
2·85	—	1	83	,,	,,	10·5	9·2	39·4	37·8	31·3	2·91	56	56	6	30	5·5	7·4	27·5	16·5	542	28·1
2·81	—	,,	63	,,	,,	10·2	8·5	28·8			2·96	55	54	8	30	5·5	7·5	27·6	16·1	541	27·9
3·02	—	2	83	,,	,,	10·2	9·4	42·4			3·03	54	50	8	30	5·5	7·3	27·5	16·6	572	35·2
2·97	—	,,	63	,,	,,	11·0	8·9	34·8			2·96	53	45	8	30	5·5	7·2	27·6	16·1	547	29·3

paste with conventional equipments for the preparation of sizing mixture for jute was followed. Half the quantity of cold water was run in the mixing tank and full quantity soda ash was then added and stirrer started, T.K.P. was added slowly by passing through a 40-mesh sieve. Steam was turned on and the final volume adjusted by adding the remaining quantity of water after different periods of boiling (½ hour, 1 hour and 2 hours). Formaldehyde was then added. A known amount of the size was taken and evaporated to dryness and the solid content estimated to obtain the concentration of size. The results indicate mean of duplicate estimations. For the determination of viscosity, the sample was strained through a muslin and the time of flow was measured in a Shirley tube (XE 523) at 25°C. ± 0·5.

The yarn sheet composing the number of threads (9·5 lbs./spyndle grist) required for B twill fabrics was drawn from the bobbins on the beaming creel and passed through the nip of the sizing rollers in the sowbox. Size was applied from each preparation at two different temperatures (83°C. and 63°C.) which were maintained within ± 2°C. at a constant level of size in the sowbox. The yarns were subsequently dried over steam-heated cylinders under identical conditions.

After that the particular beam was made and a few yards of warp yarns were cut right across the beam. The sized warp yarns from the cut samples were tested for grist, strength, etc. Sample of yarns was also taken similarly for estimation of size content. The beam was set in the loom and 30 yards of cloth were woven and tested for quality (breaking strength in lbs.), oz./square yard, etc. Warp breakages in the loom during weaving were noted and loom caddies were collected and weighed. Control weaving experiments were carried out with yarns of 9·5 lbs. and 11 lbs. grist after dampening with water only and the results of the experiments are set out in Table 1.

Results and discussions

From Table 1 it may be seen that the boiling of the size for different periods under the concentration of alkali used appears to have no appreciable effect on the viscosity of the size; consequently the viscosity of the size for different periods of boiling was not determined separately for higher concentrations. It appears that the viscosity has considerably increased with concentration, and at 3% it becomes highly viscous as evident from the time of flow.

Table 3

Conc. of size %		Wt. of original sized yarn (bone dry) Z	Wt. of leached yarn (bone dry) Z_1	Wt. of unsized yarn (bone dry) $\frac{x}{y} \times z_1$	Wt. of size $Z - \frac{x}{y} \times z_1$	% size on unsized (bone dry) yarn	Average
0·55	(a)	8·8150	8·3183	8·758	·057	0·65	·635
	(b)	7·1784	6 7742	7·1340	·0444	0·62	
0·55	(a)	7·6551	7·2230	7·605	·0501	0·66	·625
	(b)	7·6941	7·2655	7·649	·0451	0·59	
0·57	(a)	8·8634	8·3653	8·808	·0554	0·63	·620
	(b)	7·8675	7·4264	7·820	·0475	0·61	
0·58	(a)	7·7393	7·2977	7·683	·0563	0·73	·705
	(b)	7·1675	6·7616	7·119	·0485	0·68	
0·55	(a)	8·5020	8·0235	8·448	·0540	0·64	·645
	(b)	7·1993	6·7930	7·153	·0463	0·65	
0·55	(a)	7·9929	7·5430	7·943	·0499	0·63	·615
	(b)	6·2644	5·9146	6·227	·0374	0·60	
1·00	(a)	7·7234	7·2638	7·647	·0764	1·00	1·045
	(b)	9·2402	8·6811	9·141	·0992	1·09	
1·08	(a)	7·3417	6·8854	7·249	·0927	1·28	1·175
	(b)	7·7318	7·2664	7·650	·0818	1·07	
1·01	(a)	7·7247	7·2601	7·643	·0817	1·07	1·085
	(b)	7·0486	6·6222	6·9720	·0766	1·10	
1·03	(a)	7·5808	7·1161	7·494	·0868	1·16	1·095
	(b)	7·6971	7·2367	7·619	·0781	1 03	
0·98	(a)	8·2036	7·7116	8·121	·0826	1·02	1·11
	(b)	8·9433	8·3920	8·837	·1063	1·20	
1·02	(a)	8·1403	7·6573	8·063	·0773	·96	1·005
	(b)	7·3217	6·8825	7·246	·0757	1·05	
2·06	(a)	8·2200	7·6553	8·061	·159	1·97	2·035
	(b)	8·1172	7·5514	7·950	·1672	2·10	
2·04	(a)	7·3338	6·8352	7·196	·1378	1·91	2·035
	(b)	8·2073	7·6290	8·034	·1733	2·16	
1·95	(a)	7·0347	6·5414	6·889	·1457	2·11	2·040
	(b)	8·5444	7·9570	8·379	·1654	1·97	
1·95	(a)	8·8368	8·2444	8·680	·1568	1·81	1·905
	(b)	9·9376	9·2553	9·743	·1946	2·00	
1·93	(a)	8·4705	7·8860	8·303	·1675	2·02	2·05
	(b)	8·4128	7·8280	8·241	·1718	2·08	
1·92	(a)	8·8144	8·2118	8·646	·1684	1·95	1·955
	(b)	9·5946	8·9376	9·410	·1846	1·96	
2·47	(a)	8·6719	8·0450	8·472	·1999	2·36	2·355
	(b)	12·7115	11·7953	12·4200	·2915	2·35	
2·47	(a)	7·9547	7·3663	7·7570	·1977	2·55	2·47
	(b)	8·1279	7·5389	7·938	·1899	2·39	
3·11	(a)	8·4937	7·8240	8·237	·2567	3·12	3·135
	(b)	8·5818	7·9011	8·320	·2618	3·15	
3·07	(a)	9·3896	8·6274	9·084	·3056	3·36	3·29
	(b)	8·0255	7·3836	7·775	·2505	3·22	
2·85	(a)	8·6851	8·0244	8·448	·2371	2·81	2·91
	(b)	7·6205	7·0261	7·398	·2225	3·01	
2·81	(a)	9·3487	8·6261	9·082	·2667	2·94	2·96
	(b)	8·3498	7·7003	8·108	·2418	2·98	
3·02	(a)	8·4564	7·8034	8·217	·2394	2·91	3·03
	(b)	7·9355	7·3067	7·693	·2425	3·15	
2·97	(a)	8·3564	7·7143	8·123	·2334	2·87	2·96
	(b)	8·0636	7·4323	7·825	·2386	3·05	

Effect of Temperature

In starch sizing, the effect of temperature has been stressed by Syedel[4] and Hart[5] but no such work has been reported on sizing of jute yarns with T.K.P. Apparently Macmillan and Chakraborty's[6] work was partly aimed at finding out the most suitable temperature for the application of T.K.P. paste to jute yarns, but this has not been reported in the paper.

Table 2

Sample Ref.	Wt. of original unsized control yarn (oven dry) x	Wt. of same yarn after leaching treatments (oven dry) y	Factor x/y	Average
Unsized yarn—grist 9·7 lbs./spyndle	8·7556	8·2670	1·0591	
,,	8·1296	7·7623	1·0473	1·0531
,,	7·7806	7·3889	1·0530	

In the Indian jute industry, wide variations in temperature of sizing are observed from mill to mill. For this reason, the effect of sizing temperature (83°C. and 63°C.) was studied. The results given in the table indicate that the breaking strength of yarn increases to a slightly greater extent at lower temperature than at higher temperature of application, up to 2% concentration of the size. But with further increase in concentration the effect is reverse. It also appears that a boiling period from ½ to 1 hour is quite suitable for the preparation of the size.

Effect of Concentration

Table 1 shows that with 0·5% size concentration, the breaking strength of the yarn increases by about 12%, and it goes on increasing continuously with the increase in concentration of size, reaching a maximum of 37% at 3% concentrations. It was not, however, possible to carry out sizing operations with a concentration higher than 3% for practical difficulties due to very slow flow of the size from the preparing tank to the size box, and even at 3% concentration it took considerable time to fill the sowbox up to the required height.

The warp breakages in the loom and

the caddies collected during weaving decreased on application of size, the former reaching the minimum at 2% concentration. Any further increase in concentration appeared to have very little effect. The quality of the sized yarn has been more or less reflected on the woven fabric as shown by its warpwise breaking strength. It will also be seen from the table that the weight of the fabric per sq. yd. has not exceeded the usual weight of fabric of the same specifications except in a very few cases by a small amount.

The size content of the yarn was estimated by the method suggested by Das and Wareham[7]. But as their correction factor could not be adopted for concentration range other than that studied by them, the loss in weight due to water leaching alone was not determined. The blank was estimated and the final weight of the sized yarn after both the leaching treatments was taken. As the ratio of the weights of the sized yarn to those of the corresponding leached ones is practically constant throughout the range of concentration studied, it follows that the size has been completely removed from the yarns for all concentrations and the factor adopted by Das and Wareham may be equally applied here also. The results are given in Tables 2 and 3. It appears that the pick-up value of the size has been nearly 100% which does not seem to be affected by sowbox temperature studied.

Summary

Laboratory trials on sizing of sacking warp yarns made from commercially used blends of jute, mesta and root-cuttings show that the warp breaking strength increases on application of size in the concentration range from 0.5 - 3%. Although maximum breaking strength of yarns and fabrics, and minimum amount of loom caddies are obtained at 3% concentration (this does not appear to be suitable for mill practice owing to rather slow flow of the size) warp breakages in the loom appears to be minimum at 2%. The quality of the sized yarn is more or less reflected on the fabric woven. A temperature of 63 ± 2°C. in the sowbox appears to produce better results up to 2% size concentration, but at higher concentration a temperature of 83°C. appears to be better. A period of boiling from ½ - 1 hour appears to be quite suitable for the preparation of size.

Although laboratory trials show considerable improvement in quality of the sacking warp yarns on sizing, final conclusion can only be drawn after bulk trials are carried out in mills, keeping in view the economic factors involved in the extra processing and the increased loom efficiency as evident from the reduction in warp breakages.

Acknowledgment

Our thanks are due to Dr. P. B. Sarkar, Director, Technological Research Laboratories, for his kind interest and permission to publish this paper.

References

(1) Macmillan and Chakraverti: J. Sci. industr. Res., 1951, 10B, 13.
(2) Das, Guha and Wareham: Tex. Man., 1953, 79, 139.
(3) Nodder and Gillies: T.R. Memoir No. 1, 1940.
(4) Syedel, Dyer and Tex., Ptr., Jan. 17, 1936, pp. 70, 71.
(5) Hart, Amer. Dyer Rep., May 18, 1936, p. 258.
(6) Macmillan and Chakraverti: J. Sci. industr. Res., 1951, 10B, 270.
(7) Das and Wareham: J. Sci. industr. Res., 1951, 10B, 256.

New Resin Finish

A new thermo-reacting resin finish for imparting durable crease resistance and dimensional stabilisation to cotton and rayon fabrics, with greater resistance to chlorine retention, is available from Du Pont. "Zeset" MC has been developed especially for use on wash-and-wear fabrics. Crease resistance and dimensional stabilisation obtained with it are reduced only moderately by repeated home launderings or accelerated wash tests starting at the boil.

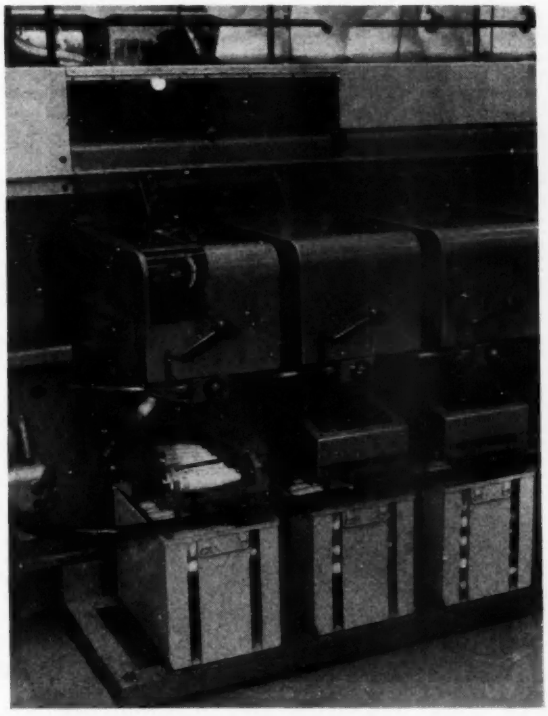
* * *

Scottish Linen Trade's Difficult Year

Mr. H. A. Nicholson (president, Flax-spinners' and Manufacturers' Association of Great Britain) speaking at the recent annual meeting in Dundee, stated the past year has been the most difficult since the war for the Scottish linen trade. Not only had competition at home and abroad been intensified but the industry had been faced with a contraction of business as a result of the credit squeeze, and the restriction of purchases by government departments. Damage was also being done by imported textiles, particularly cheap kitchen cloths and other linen goods which were swamping the home market in large quantities from abroad. These difficult conditions had been reflected in reduced activity, some short time working, and in a contraction of the industry as a result of several closures and amalgamations.

New developments of great import included new proofings, as well as an all-purpose kitchen towel backed by a mark of certification. This Scottish trade mark of a high quality kitchen cloth had proved popular and had attracted attention at home and overseas, although it had been launched only on a limited scale for the local Scottish market.

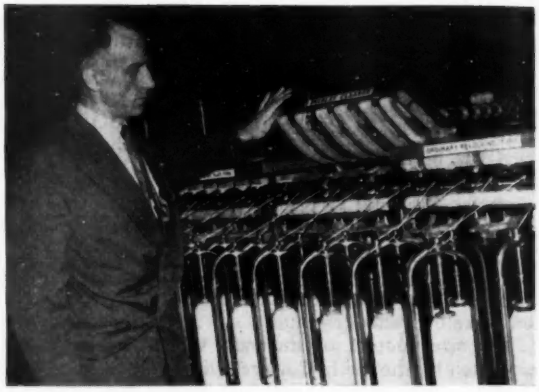
Mr. A. D. N. Smith (director, Boase Spinning Co. Ltd.), was appointed president in succession to Mr. Nicholson.



Cotton Stacker
This photograph, taken at the recent textile machinery exhibition at Belle Vue, shows the new Muschamp SS166 cotton stacker. A feature which greatly impressed visitors is that when the box is full of pirns, it can be removed, leaving a reserve of ten pirns. This allows the machine to carry on winding whilst the box is being emptied and returned for use. Incidentally, the SS166 is also equipped with the company's special blowing equipment and tail and "winding in" arrangements

Progressive Research

New Developments from Shirley Institute



Mr. J. Mayoh (Spinning Dept.) demonstrates a new top-clearer for two-zone speedframes

IT is doubtful whether Shirley Institute has ever had a more interesting array of new equipment on view than that seen during the recent "members' days" and one new development of special interest was the cop sorting technique devised to deal with condenser spun yarns. It is only when one sees faulty cops being diverted that one really appreciates the importance of winding to the finished fabric and, of course in the appearance, too, since "barring" leads to streaky dyeing, etc. On the condenser system of spinning it is more difficult to control the counts of yarn than in normal cotton spinning and in consequence count variation can occur from cop to cop. This leads to the formation of block bars in the woven cloth and, apart from the unsightly appearance, also reduces the serviceability of the finished article.

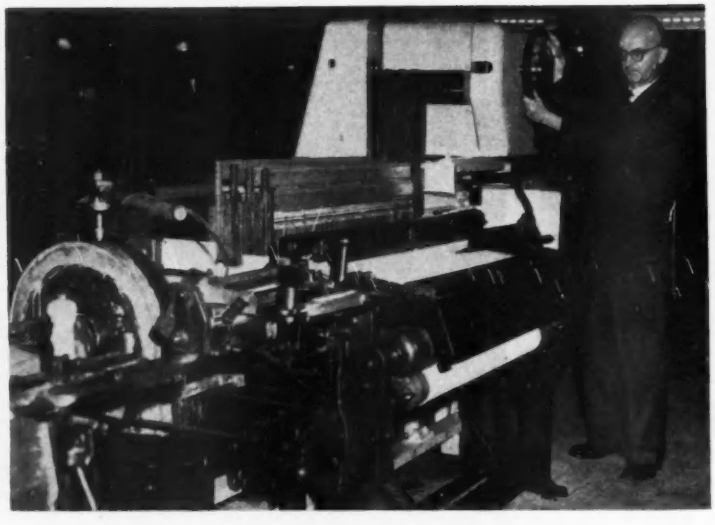
The new cop sorting system alleviates the problem, however, as the cops or bobbins of yarn are all weighed and sorted automatically into limited weight ranges which correspond (since the same length of yarn is put on each package) to limited count ranges. This is done by putting the cops into the lattice of the Shirley cop feeder, which arranges the cops and feeds them, suitably aligned, individually, to an electronic checkweighing machine manufactured by Geo. Driver and Son Ltd., Abbeydale Road, Wembley, which weighs each cop and directs it into one of three channels according to weight. The operation proceeds at a rate of one per second. It will be appreciated, therefore, that from any one batch of yarn, three separate smaller batches are produced, but the variation in each is only one-third the original and, in general, this is insufficient to produce any block barring in the cloth.

The Shirley loom (made by Wilson and Longbottom Ltd.) was on show, of course, also the new Shirley dobby which was fixed to an overpick loom and occupied no more floor space than the loom itself.

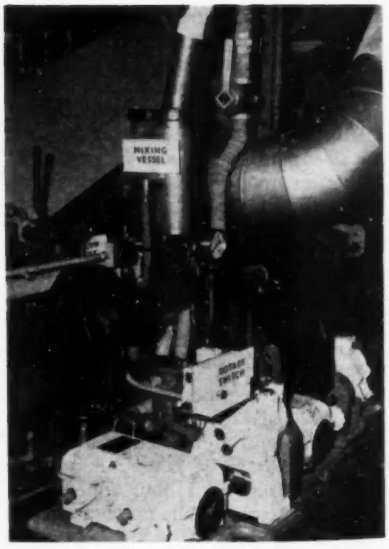
One of the most interesting results of research was the attachment for stretch-breaking and spinning of "Terylene" tow on conventional machinery. The secret of this comparatively simple device, is that the break is attained by using the actual draft of the machine rather than any special devices in the drafting zone. The device was seen on a dandy rover with subsequent spinning on a worsted ring-frame.

An experimental machine for the application of polymer-forming substances to cellulose fabrics was a laboratory machine designed to simulate the crease-resist process-application. Two big advantages of this machine are its slow speed of operation, permitting maximum observance, also the use of narrow-width fabric, which reduces wastage to a minimum.

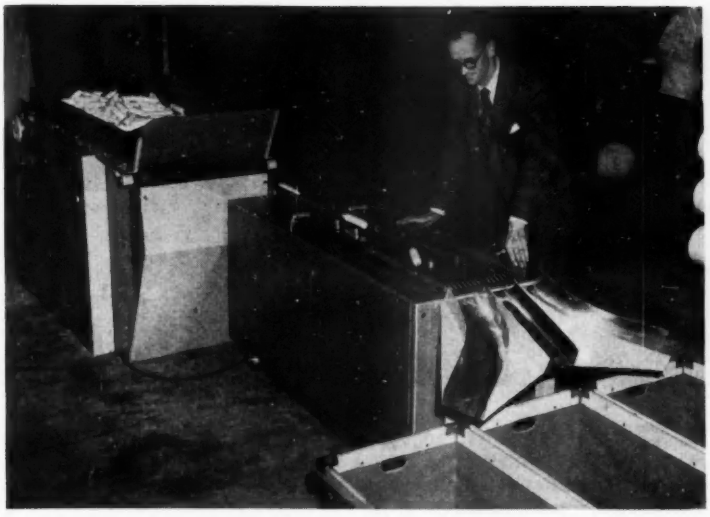
One of the most interesting exhibits was the Shirley Flash Ager, a small unit of which was seen a year ago. The full scale ager, seen in operation, handles cloth up to 42 ins. wide at a maximum speed of about 20 yds./min. The cylinders may be increased if desired to four, this giving a proportionate increase in output. The Flash Ager is primarily designed for ageing vat colours printed by the Colloresine process. The printed fabric is padded with a solution of sodium hydrosulphite and caustic soda and is then passed between the surface of the cylinders which are heated to about 102°C. and an endless belt which serves to exclude air and largely to prevent evaporation of moisture.



Dr. I. H. Thomas (Weaving Dept.) at the side of the Shirley dobby



Experimental dry-feed attachment fitted with improved continuous slurry mixing unit on sizing machine



Mr. A. W. Forman (George Driver and Son Ltd., Wembley) is shown demonstrating a new cop sorter. In the background is the checkweighing machine developed by Shirley, and in the foreground the electronic automatic selection equipment designed and manufactured by George Driver

To avoid marking-off, the cylinders and the belt are continuously washed. The Shirley machine will be cheaper than existing machines and the cylinders may be run at different temperatures when this is desirable. It takes less steam than conventional agers and can be used within a few minutes after starting up from cold; prints tend to be sharper, and with some colours yields are better. The machine is being manufactured by Sir James Farmer Norton Ltd., and has several potential applications besides ageing of prints. It may be used, for instance, in desizing and bleaching process.

In the sizing section, several new developments were on show for the first time. Demonstrated was the experimental dry-feed attachment to the Shirley automatic size-box. A 36s single's poplin warp was used for demonstration purposes. In this attachment, starch powder, stored in a large hopper, is fed automatically at the correct rate into an improved type of continuous slurry-mixing unit. Molten tallow is also metered continuously to the system and dispersed by whisking in a warm mixture of slurry and gelatinised size before entering the working section of the box. The new model automatic size box, manufactured by Joseph Hibbert and Co. Ltd., also attracted considerable attention.

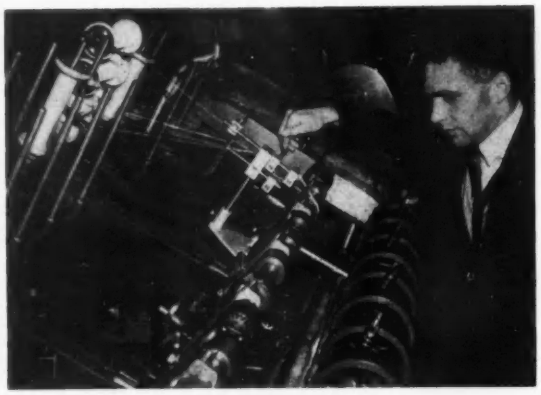
Draft control at the tape frame was also demonstrated. A new device provides for precise, continuously adjustable control of the stretch or draft applied during sizing to a warp as it passes between the squeezing rollers and the draw-roller of the tape frame. The mechanism is inserted in the side-shaft of the machine and enables the draft to be pre-set, or re-set during running, to any desired value with an accuracy of $\pm$ 0·1%. Such accuracy of setting is not possible with the usual type of infinitely variable gear working alone but, by combining this type of gear with a differential motion, it is possible to contract the speed-change ratio of the system by any desired factor. This enables the range of percentage draft normally encountered in sizing to be covered by an open scale extending over the whole range of adjustments of the gear.

In the raising process, a cylinder-raising machine manufactured by Tomlinsons (Rochdale) Ltd., had dynamometers inserted between the drive pulleys and roller shafts of two typical cardwire rollers. The reaction between cardwire and cloth and the power consumed in raising may thus be determined, because for a given cloth on a particular machine, two factors control the amount of raising done—the cloth speed which is easily measured, and the energy transfer between the raising rollers and the cloth. Measurement of the energy transfer, therefore, enables accurate control of the raising action to be achieved.

Work on scouring of blended yarns and fabrics at the Institute has shown that blends of cotton and viscose rayon will withstand kier-boiling at pressures of up to 50 lb./sq. in. making it technically permissible to use dirtier and cheaper cottons. Cellulose triacetate and "Terylene" can tolerate only mild treatments with alkali but blends of these fibres with dirty cottons can be bleached satisfactorily with sodium chlorite. This work is now being extended to mixtures of cotton and acrylic fibres. Regarding blends and blending, most of the work on nylon blends has been completed, and further work is in progress on two component blends in which the following fibres are involved: cotton, "Fibro," "Tricel," "Celon," "Terylene," "Acrilan" (regular and high bulk).

At the annual general meeting Dr. D. W. Hill (Director of Research) said a new method of using the Shirley Ampli-dry to measure the moisture content of continuous filament rayon warps had been very successful. The method employs a special type of roller electrode which rides on the warp just before it leaves the last drying cylinder. Industrial installations of this device, he said, had been working continuously during the year on both acetate and viscose rayon warps with results completely satisfactory. "For some time past," said Dr. Hill, "we have been convinced that work on the finishing side should be stepped up in certain directions. We have, therefore, increased the effort being put into the understanding of cellulose reactions and the production of cellulose derivatives with a view to finding useful applications in the permanent finishes field. We believe that a permanent flame-resistant finish is still a desirable object to pursue and a number of promising lines have been followed. So many people all over the world have worked in this field without so far producing a really successful solution to the problem that we believe it also warrants a fundamental study of the burning of cellulose. We have, therefore, started work on the nature of the chemical reactions occurring during the burning of cellulose in the hope that when we know more about how cellulose burns we shall be in a stronger position to say how burning can be prevented. We are

Dr. W. G. Harland demonstrates a new flash ager produced by Sir James Farmer Norton Ltd.



Mr. A. Newton (Junior Research Officer), Silk Dept., demonstrates a device for stretch breaking and spinning "Terylene" Tow on conventional machinery

Mr. M. Denton (Research Officer), Finishing Dept., adjusting the airflow rate on the package permeability apparatus

also pursuing other lines of research into the preparation of cellulose derivatives which may have a variety of interesting and valuable properties. The effort has so far been concentrated on oxidised cellulose, of which we already have a wide knowledge from past work, and which we believe we can now turn to practical account through the wider possibilities of chemical reaction which it offers. A feature of the organisation of this research is the teamwork involved between organic and physical chemists, physicists and spectroscopists; the need for such teamwork illustrates further the value of a central co-operative organisation such as the Institute in making available in one organisation such a wide range of specialised skills."

Dr. Hill said that a great deal of work had been carried out on the use of sodium chlorite.

"This is the only bleaching agent capable of producing a really first-class white on unscoured or mildly scoured cotton without significant tendering," he said. "It is particularly efficient in removing seed-coat, and, reflecting again our current interest in blends, it can be used safely for bleaching mixtures of cotton and any of the man-made fibres," he said.

"Courlene X3" Expansion

Further expansion in the production of "Courlene X3," the high-tenacity polythene yarn developed by Courtaulds, is to take place at the Little Heath, Coventry, factory of British Celanese Ltd. By early 1959, output is expected to be doubled. Present production is largely in the form of monofils, but multi-filament yarns, which are finding increasing use in many different industries, will account for an expanding proportion of future output. "Courlene X3" is used for a wide range of industrial purposes where its specialised properties have proved particularly advantageous. Such uses include fishing nets and lines, ropes and twines, filter fabrics, electrical interlinings and deck chair canvas.

New advances in plant design and production techniques are being incorporated in the expansion, and it is expected that the physical properties of "Courlene X3" (its tenacity is already comparable with the highest range of synthetic fibres) will be improved still further. In addition to high strength, "Courlene X3" has good abrasion resistance, a very high resistance to chemicals, and is rot-proof.

* * *

American Spinner Re-equips with British Machinery

Stone Platt Industries Ltd.—through their subsidiary company, Platt Bros. (Sales) Ltd., Oldham—announce the successful conclusion of a contract with the Beacon Manufacturing Co., Carolina, for cotton spinning machinery comprising 20 000 spindles to a value of over 800,000 dollars. This order was secured by Platt's in face of world competition and deliveries will commence early next year.

* * *

Progress of Croda Organisation

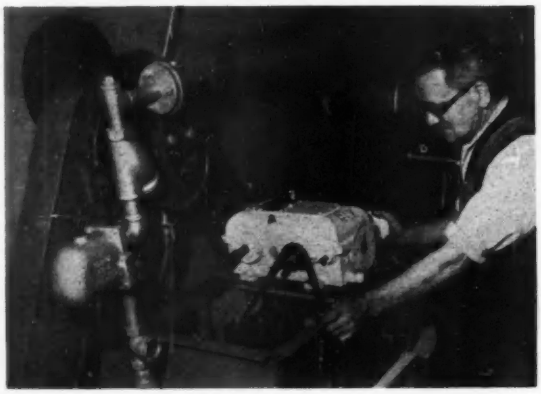
Two important developments are announced by Croda Inc., New York, the U.S. subsidiary of Croda Ltd., Goole, England. First is the acquisition of the issued capital of Hummel Lanolin Corp., a company formed to take over the lanolin and wool grease division of the Hummel Chemical Co. Inc., Brooklyn, New York. Hummel Lanolin Corp. will continue to function as a subsidiary of Croda Inc.

The second is the establishment of a modern lanolin manufacturing plant at 185 Foundry Street, Newark, New Jersey. This will supply the requirements of lanolin and lanolin derivatives for Croda Inc. and Hummel Lanolin Corp. and also for much of the needs of the Croda organisation for the American continent. This new plant is the latest in a series of modern lanolin processing units Croda has set up in England, Italy and Belgium over the last few years. Conveniently located plants and wide range of sales offices and agents means buyers can get their supplies in any new location rapidly and without undue cost.

* * *

Commercial Library Publications

"Advertising and Market Research" is the title of a pamphlet showing the resources of the Manchester Commercial Library on these subjects in the form of periodicals, statistical data, dictionaries, directories, annuals, readership surveys, consumer reports, marketing surveys and text books. The list is selective and should prove most useful both to advertising executives and clients. Numbers 8 and 9 in the library's European Economic Co-operation series of reading lists are also available. Copies can be obtained from the Commercial Library, Central Library, Manchester 2 (CENtral 7401, Telex 66-149).



Demonstrating the preset draft control mechanism inserted in the side shaft of a sizer to give precision control of the draft applied to the warp sheet between the squeezing rollers and the draw roller

Metallic Threads Increase Design Possibilities in Terry Towels

The bright, glistening properties of these yarns can be exploited to the full without affecting the soft, absorbent nature of the towel

By T. HARGREAVES

ON first thoughts it would not appear to be a very desirable proposition for metallic threads to be used in the construction of terry towels. They do not absorb moisture, which is the prime essential of a terry towel, and they also have a harsh feel which is the exact opposite to the soft nature expected in a towel. It must never be forgotten, however, that modern designs in terry towels rely largely on the best possible use being made of bright, attractive colours and shades, and metallic yarns in gold, silver, bronze, green, red, blue and other strong colours have drawn the attention of towel designers to the wide range of possibilities open to them. The main problem has been to exploit to the full the variety of bright, glistening properties which these yarns impart to any fabric, and at the same time eliminate satisfactorily any harsh feel which these threads might give to the towel if used indiscriminately.

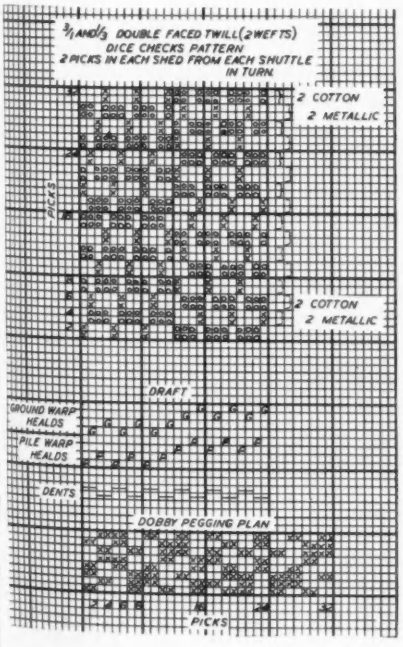


Fig. 1A

It is customary practice in the towel trade to weave fancy headings of non-terry at each end of the towel. In these headings weaves are used varying from the ordinary type terry weave without the loops, to double-faced, long float, fancy weave effects in which the weft plays such an important part. Needless to say headings of this character add considerably to the sales value of towels and, in many cases, good quality mercerised plied cotton weft yarns are often used in weaving these decorative headings in the towels. It was to create and enhance the appearance of these fancy woven decorative headings that some terry towel designers turned in their first endeavours to incorporate metallic threads into their products. Like many first time ventures the early efforts were not attended with the success expected but it did not take long to find the reason. The metallic thread was introduced into these headings in the form of long float, extra weft effects in place of the usual plied mercerised cotton but the result left much to be desired. The metallic threads certainly glistened and they undoubtedly attracted all the attention the designers had anticipated but the product had a harsh feel that cancelled out the attractiveness of the metallic threads.

Designers quickly recognised that the main problem then was to try and eliminate any semblance of harsh feel without in any way detracting from the remarkable appeal these yarns made to the discriminating purchaser. One method adopted was to still use the mercerised plied cotton yarns along with metallic yarns, picking 2 picks from each in turn. This was quite effective in producing alternating diagonal line effects in the headings but the metallic threads woven on the long float extra weft effect method still felt harsh to the touch.

The cure for this lies then in limiting the length of the float when metallic threads are used. A change of ideas in the designing of these specialities brought to light a method of using the metallic threads as weft in what was almost a plain weave. This diversion produced a smooth yet brilliant background weave over which coloured 2/12s mercerised cotton weft was floated to form a very bold type of design.

The background weave used for the $\frac{1}{64}$ in. Lurex MM silver 150 gauge, supported by "S" or "Z" twist single

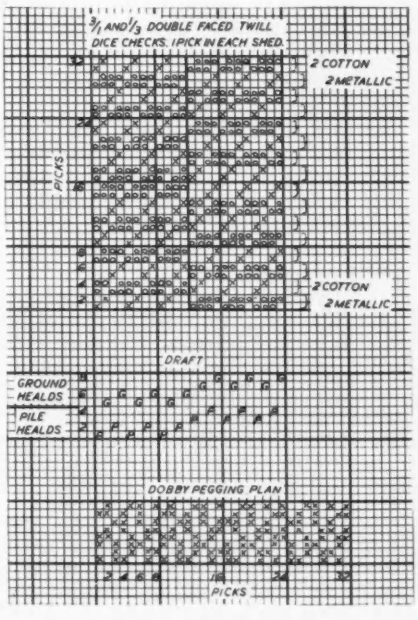


Fig. 1B

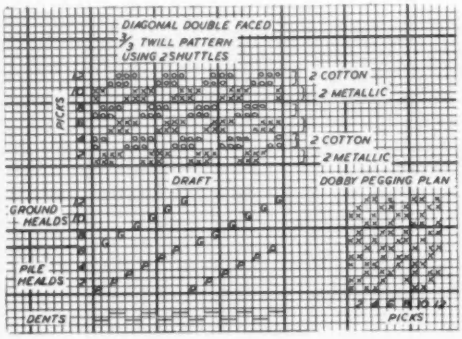


Fig. 2

end 70 den. nylon was that formed by using the second and third picks of the three-pick terry weave, which weaves one pile and one ground together (2 ends) in plain order, with the next pile and ground together (2 ends). Changing the background weave to the one and one full plain weave caused wrinkling in the cloth but this disappeared again when the weave described above was employed. The float of the coloured mercerised cotton could be any length within reason.

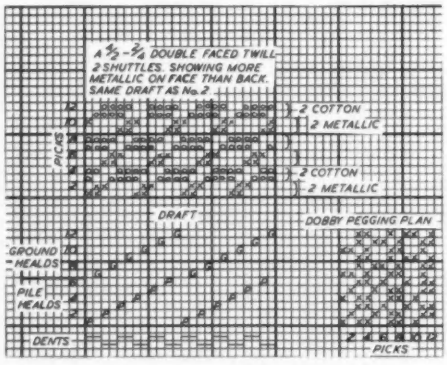
A very pronounced herringbone effect was woven with 2/12 black mercerised cotton weaving a 6 up, 6 down, double-faced alternating twill on the silvery background weave using silver Lurex weft, $\frac{1}{64}$ in., 150 gauge MM quality, supported by a single end 70 den. nylon yarn. One very pleasing feature was the complete elimination of any semblance of harshness whilst at the same time full use was made of the distinctive properties of the metallic thread. A photograph of this silver and black herringbone heading woven on pre-dyed daffodil yellow towel body yarns is shown at example (3) in the photograph and the design and draft are given in Fig. 5.

No. 3 in the photograph is also another example with the silver and black herringbone heading woven on pre-dyed black towel body yarns. In this towel the 2/12s black mercerised cotton weft in the heading is replaced by single 14s black which imparts greater prominence to the silver.

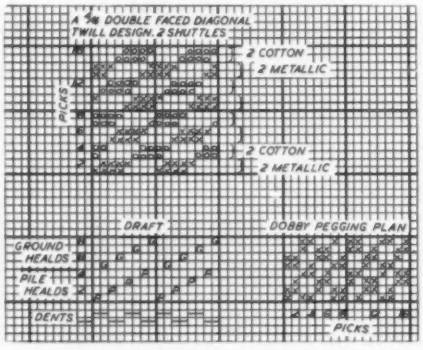
Jacquard Designs

The principle of weaving silver Lurex in a background weave and superimposing a figured design on it was then tried out in a full harness jacquard terry towel weave. The loom selected was a 32 ins. reedspace, fully automatic weft replenishing model with a 4×1 multiple drop-box, automatic positive let-off to the pile beam, and equipped with a 624 hook double-lift, double cylinder jacquard with the cards at the sides. After gaiting-up and running at 162 picks/min., a weaver ran two of these full harness jacquard looms in a set of 12 looms. The other 10 were 16-shaft dobby, automatic terry looms. The wefts (*a*) metallic, (*b*) mercerised and (*c*) the body were all automatically replenished.

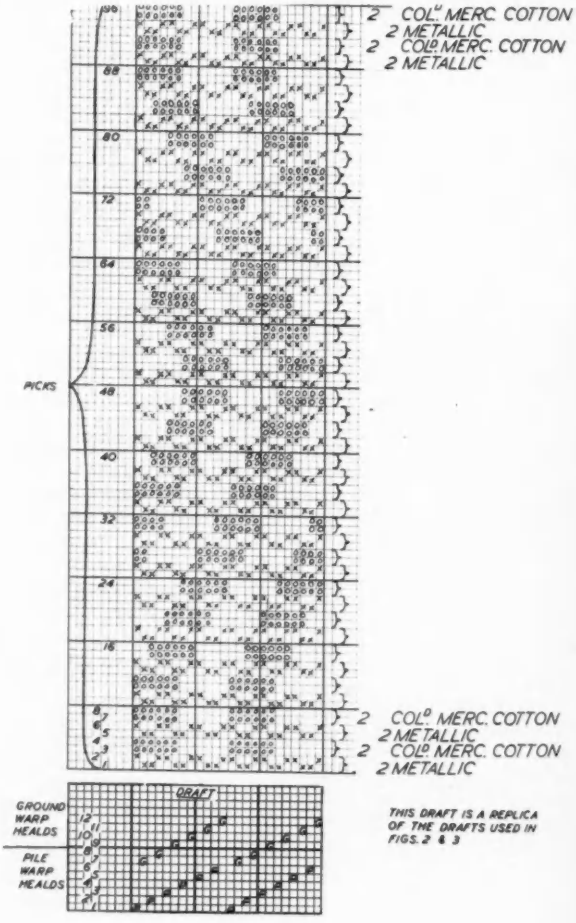
Two comber-boards were utilised. The front one, carrying the pile ends, had six long rows of holes to correspond to the first six rows of hooks in each row of 12 hooks in this 12×52 (624) hook jacquard. The back comber-board carried the ground threads so that pile and ground yarns were all in the harness; this comber-board also had six long rows of holes to correspond to the last six rows of hooks in the jacquard. The two comber-boards were correctly lined one behind the other so that the companion pile and ground threads in



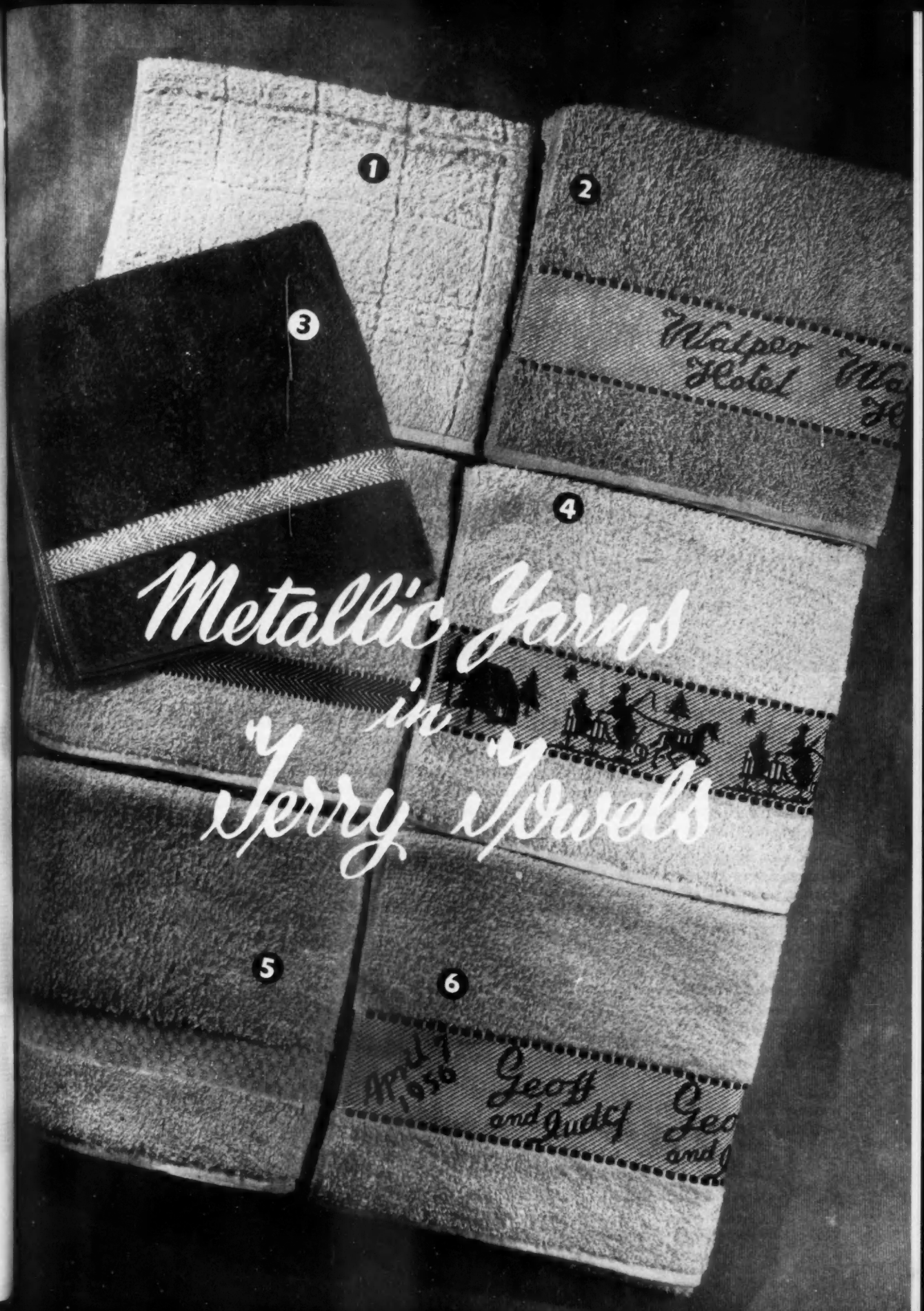
(left) Fig. 3

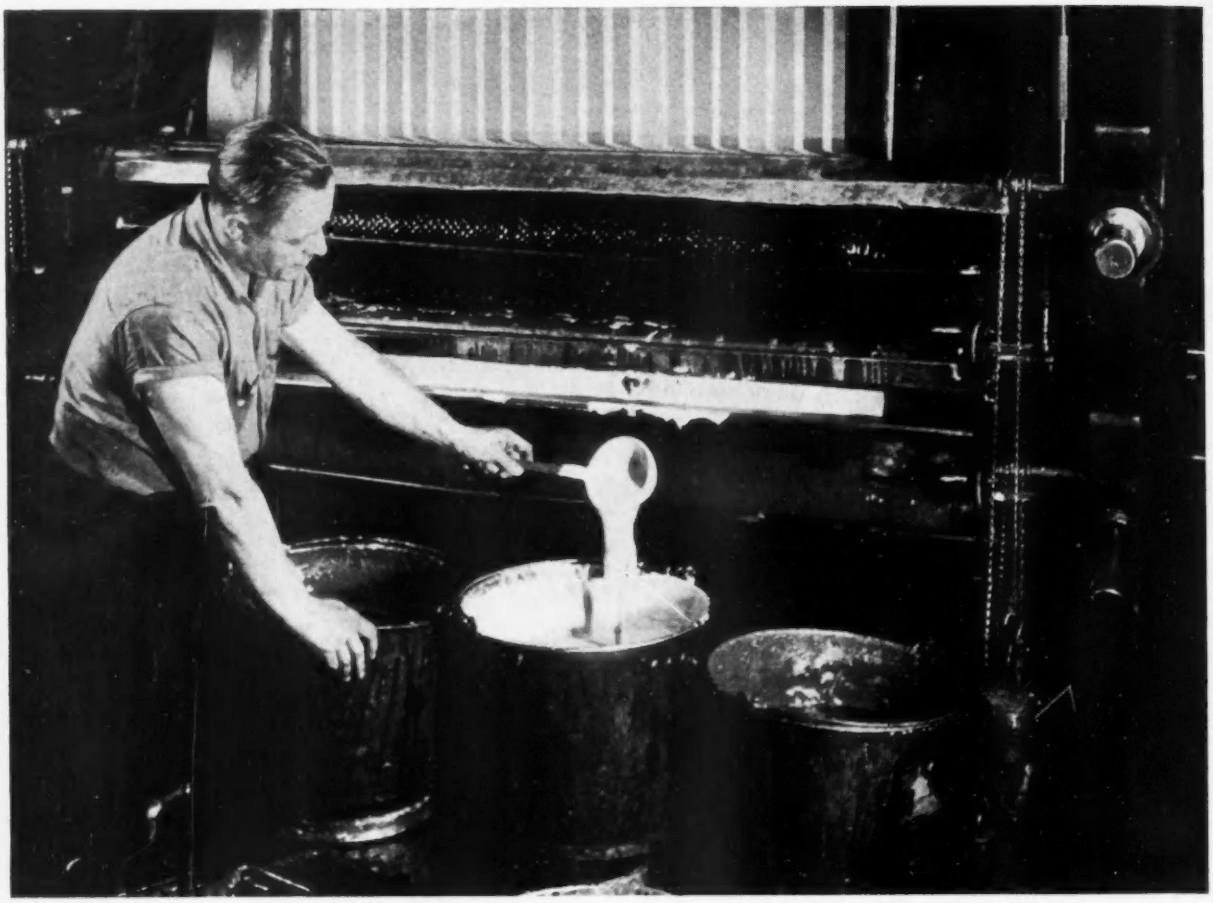


(left) Fig. 4



(right) Fig. 5


1
2
3
4
5
6
Metallic Yarns in Terry Towels
Walper Hotel
Geoff and Judy



How to set the pace in fastness

A significant advance in textile printing occurred with the advent of resin-bonded pigments. These new colours permitted striking patterns in brilliant shades with excellent fastness to sunlight, atmospheric fumes, washing and dry cleaning. But they still left something to be desired on crocking.

What was needed was a simple method of better protecting the pigments against severe abrasion. Today's solution is one in which CHEMIGUM LATEX plays a major role. Easily modified with other materials and mixed into the colours at the printer's, CHEMIGUM LATEX helps form a protective coating which locks in the pigment particles. The end result sets the current pace in fastness to crocking, plus even further improving resistance to washing.

Putting a liquid lock on pigment colours is one of many textile uses for CHEMIGUM LATEX. Its high binding strength, flexibility, light colour–and resistance to washing, dry cleaning and age–are finding wide application in binders, coatings, finishes and adhesives of all types. To learn more about CHEMIGUM LATEX–contact your nearest Goodyear Chemical Distributor.

CHEMICAL
GOODYEAR
DIVISION

Distributed in the United Kingdom by:

HUBRON SALES LTD., FAILSWORTH, MANCHESTER

TEL: FAILSWORTH 2691

Other Distributors in All Western European Countries

Goodyear International Corporation, Chemical Division, Akron 16, Ohio, U.S.A. The Goodyear Tyre & Rubber Company (Great Britain) Ltd., 17 Stratton Street, London W1, England

Chemigum, Plioflex, Pliolite, Pliovic –T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio, U.S.A.

CHEMIGUM • PLIOFLEX • PLIOLITE • PLIOVIC • WING-CHEMICALS

High Polymer Resins, Rubbers, Latices and Related Chemicals for the Process Industries

The cards and double comber board arrangement

the dents of the reed were perfectly aligned.

The pile warp design was cut on the first half of the cards and the ground design on the remaining half. In the body of the towel—which was the ordinary 3-pick terry distributed on both faces—the pile and ground were yarn dyed, as also was the weft. The ground was 2/24s cotton, the pile 1/16s cotton, the weft 1/14s cotton. The reed was 32 dents/in., and it was woven 40 picks/in.; the ratio of terry to ground was 5·6 : 1.

In the 3 ins. wide picturesque border, the design was cut twice on each card—once on the first half for the pile ends and repeated exactly on the second half for the ground warp. The design is a Canadian winter scene of pine trees, log cabins and horse-drawn sleighs, in which the end designs of log cabins are on 120 pile and 120 ground ends; the sleigh design is on 180 pile and 180 ground ends. The snow effects were formed by silver Lurex MM weft, and the cabins, trees and sleighs formed by the float weave of the 2/12s mercerised black cotton weft. This black weft was bound in 10×2 twill order into the background weave.

No. 4 in the photograph of towels shows this winter scene heading in silver Lurex and black mercerised cotton on a pink pre-dyed body. Photograph No. 2 is woven on the same jacquard and harness arrangement as in No. 4 (120 cards changed). The body is pre-dyed crystal blue and the heading silver Lurex and 2/12s mercerised cotton in a deeper shade of blue. Photograph No. 6 also utilises the same jacquard arrangement (120 cards changed); this is a light green body with heading of silver Lurex and 2/12s mercerised black.

In this strikingly effective towel, the take-up when weaving the heading was retarded to give 80 picks/in., and the black weft can, of course, be changed to any colour to suit the colours in the body of the towel. The metallic yarn was Lurex MM, $\frac{1}{64}$ in., 150 gauge, supported by 70 den. nylon. There were 240 picks in the 3 ins. deep heading; 120 picks metallic background weave, and 120 picks in the figured design portion of the heading. It is worth noting that any change of design in the heading can be accomplished by changing 120 cards. The reproductions of these dobby and jacquard woven towels clearly show the range of possibilities offered by the thoughtful use of metallic yarns as part of a design.

Simplicity is very often the keynote in successful designing. The towel (1) in those shown is a self-coloured example with gold or silver Lurex overchecks $2\frac{1}{2}$ ins. apart, combined with five lines of Lurex weft forming headings at each end of the towel. In this attractive cloth all the yarns were pre-dyed and it will also be noted that metallic yarns were also employed in the ground. Misgivings concerning the advisability of putting metallic yarns on the same beam as the 14s cotton ground warp led to a small trial beam being run first to see what happened. This ran extremely well with the metallic yarns giving less trouble than the cotton ground despite the advantage of sizing. The Lurex MM was, however, supported by a single 70 den. nylon yarn.

Satisfied with this performance, full sets of beams were then run with the metallic threads included and every warp wove right through without any unusual trouble. The metallic yarns were drawn in the ground staves exactly like the rest of the ends. Two metallic threads, drawn one end per eye, were entered in one dent of the reed every $2\frac{1}{2}$ ins. across the full width of the warp. On each side of this dent, two ground ends drawn one per eye were drawn into the dents alongside the dent carrying the metallic threads. No pile ends were drawn into any of these three dents.

This arrangement gave full scope to the effect, and the gleaming metallic threads are revealed to the best advantage. Cross-checking of metallic weft was introduced every $2\frac{1}{2}$ ins. apart. The terry loops were omitted for 6 picks; 2 picks cotton, 2 picks metallic, 2 picks cotton weft comprise these 6 picks. This also shows the metallic thread to its best effect.

This type of towel can be woven quite well on a tappet terry loom. No other weave than the usual 3-pick terry is used. The pile yarns were single 16s pre-dyed cotton. If more than two metallic threads are used to form the warp line checks, care must be taken to prevent them "rolling" when assembling them in the warp at the slasher. It must also be borne in mind that the weft pirns of metallic threads need a longer chase than the cotton ones, and the pirn diameter should also be slightly less. It is important also to employ the best shuttles lined with good quality rabbit or opposum fur. These metallic yarns are undoubtedly a very powerful stimulant to the imaginative designer and manufacturer, and a selling aid of no small value.

Alternating Diagonal

In Fig. 4, the design, draft and dobby pegging plan are given for a four and four, double-faced alternating diagonal twill design. Making full use again of metallic and plied mercerised cotton wefts enables this to be woven on 12 shafts, i.e., 4 pile, 4 ground and 4 selvedge. This, too, is another example showing the scope and possibilities offered with $\frac{1}{64}$ in., 150 gauge Lurex MM gold yarn supported by "S" or "Z" twist 70 den. nylon along with 2/20s mercerised cotton, either white or coloured depending on the shades used in the body of the piece.

A diagonal, double-faced, three and three twill pattern can also be woven in which the length of the float is limited to three ends, by using the design, draft, and dobby pegging plan given at Fig. 2. The diagonal twill lines are metallic and mercerised cotton alternating. Again two shuttles are employed to give two picks metallic alternating with 2 picks mercerised cotton. Gold-coloured Lurex MM, $\frac{1}{64}$ in., 150 gauge supported by 1 thread of "S" or "Z" twist 70 den. nylon is very effective along with 2/20s mercrised cotton, white or colour, to suit the colours used in the body of the towel. Similarly, the take-up is also retarded to give about 80 picks/in. when weaving the heading.

This weave is extremely attractive and decidedly smooth to the touch. One point which must be considered, however, is that 6 pile, 6 ground and 4 selvedge shafts (16 in all) are required. If required, it could be woven on 3 pile, 3 ground, and 4 selvedge shafts (10 in all) but the

terry loop weave of both pile and ground would be broken.

From considerable experience in manufacturing these smart towels, one fact stands out clearly. A float of four seems to be about the limit if the harsh feel is to be effectively eliminated. A four up, two down, double-faced twill could be woven using two shuttles with metallic and mercerised cotton wefts and floating the metallic threads over four and the mercerised cotton over two ends on the face.

The design, draft and dobby pegging plan is given in Fig. 3, but it must be emphasised that this weave is not reversible. This design also requires 6 pile, 6 ground and 4 selvedge shafts (16 in all) and in this example the take-up is retarded to give about 80 picks/in. when weaving the heading. Gold Lurex MM ($\frac{1}{64}$ in. 150 gauge supported by 1 thread 70 den. nylon "S" or "Z" twist is used along with 2/20s mercerised cotton, either white or colour to suit the colours employed in the body of the towel.

It is also understandable that much can be gained by using two shuttles, one for the metallic yarn and one for whatever type of yarn may be used to blend with the metallic yarns in the usual two and two weft mixing method.

A four end, three and one dice twill weave, woven double-faced and using two shuttles offers one good method of introducing metallic threads into the headings of terry towels and this weave also eliminates most of the harshness previously noted. The size of the dice checks can be varied to suit the dimensions of the towel. It is a weave requiring four healds for the pile warp and four for the ground warp, and a special type selvedge will probably be necessary when weaving such types of fancy weave headings. This entails a further four shafts, totalling 12 in all. The take-up gears will need retarding whilst weaving the heading to give about 80 picks/in., compared to say 40 picks/in. when weaving the terry portion. Lurex MM metallic ($\frac{1}{64}$ in., 150 gauge) in gold and 2/30s white mercerised cotton—or in colours if preferred—combine very well in this dice weave and it is a good plan to use 70 den. single thread nylon to support the metallic thread. Photograph No. 5 is light green pre-dyed towel body. The heading in 3 and 1, and 1 and 3 twill dice checks. The dice twill is gold Lurex and 2/20s mercerised cotton dyed to same light green shade as the body of the towel.

This dice pattern shows equally well on both faces of the towel. The pattern is woven with 2 picks in each shed and this enhances the effect. When used with pre-dyed pile and ground warps in pastel self shades the result is also very pleasing. It is not necessary to use plied cotton yarns for the body of the towel. Single pile and ground warps are sufficient. In the loom, the towels are woven 2½ ins. wider than the required finished dimension. They are afterwards washed in water at 140°F. using a good soap, cold rinsed, and subsequently dried in a festoon type loop machine. The finished towel is beautifully soft and absorbent, has fresh clear colours and will give the utmost satisfaction in use. Fig. 1A shows the design, draft and dobby pegging plan when woven 2 picks in each shed. Fig. 1B is for the same design but is used when weaving 1 pick in each shed. This weave avoids having to use extra healds for a special selvedge which becomes necessary when inserting 2 picks in one shed.

Washing Nylon Overalls†

PLAIN coloured overalls should be washed in luke-warm water (104°F., 40°C.) to prevent any loss of colour and staining of other fabrics. Overalls with coloured stripes can be treated as white, and white nylon overalls should not be washed with fabrics made from fibres other than nylon, or with coloured nylon fabrics.* This is to ensure that soiling or colouring matter from the solution is not picked up by the nylon overall. In particular, white nylon overalls should not be washed with either coloured or white cotton fabrics, though they may be washed with lightly soiled white goods made from other synthetic fabrics.

Treatment of Heavily Soiled Parts

Parts where dirt tends to accumulate during wear may be rubbed with a paste of detergent applied with a soft nail brush, prior to washing. To remove grease stains, pre-spot the heavily stained parts with a solvent soap and then wash the overalls in the normal manner. Proprietary solvent scouring agents can be used; or a solvent soap prepared as follows:—

Solution 1	Solution 2
35 grams potassium hydroxide	15 c.c. cyclohexanol
	252 c.c. oleic acid
89 c.c. water	724 c.c. white spirit

Solution 1 is added very slowly to solution 2 and continuously stirred for at least 15 mins. after all the potassium hydroxide solution has been added. The grease stained area is saturated with the solvent soap, allowed to stand for at least 30 mins., then washed as usual.

Washing

Plain coloured nylon overalls should not be washed at more than 104°F. (40°C.) and white nylon overalls at not more than 140°F. (60°C.). It is essential that the overalls are *not* boiled, otherwise irremovable creases may be set in the overall. The following process for washing nylon overalls in the laundry has been devised in conjunction with the British Launderers' Research Association.

Stock Solutions

(1) Quantities of detergent are expressed in pints of the stock solutions detailed below.

(2) Soap/C.M.C. stock solution. In each 100 gal. water dissolve 37½ lbs. 100% H.T. soap and 1¾ lbs. 50% C.M.C. or corresponding weights of soap and C.M.C. of different active contents. The stock contains 6 ozs. of 100% H.T. soap and 0.28 oz. of 50% C.M.C. per gallon.

(3) Sodium metasilicate stock solution. In each 100 gal. water dissolve 75 lbs. sodium metasilicate. The stock contains 12 ozs. sodium metasilicate per gallon.

(4) Soap quantities must be adjusted to the requirements of the load: there should be only a slight bubble of lather at the end of the breakwash, but a good lather in the first wash.

(5) Drainage time allowed after each wash and rinse is one minute.

Wash Process.—For use with water of 0° hardness. Machine size: 34 ins. × 54 ins. Degree of loading: 3½ lbs./cu. ft. Weight of load: 100 lbs.

Breakwash.—Run down cold water from last rinse of previous load to a standing dip of 10 ins.
Add soap/C.M.C. Stock—8-12 pts.
Mix well, load machine, shut doors and start.
Warm to 90°F. and run 2 mins.
Open run-off valve for 1 min., close valve.

Wash 1.—
Add soap/C.M.C. Stock—3 pts.
Hot water (about 104°F.) to a running dip of 3 in.
Add sodium metasilicate stock 18 pts.
Heat to 140°F. (white overalls), or 104°F. (coloured overalls) in 7 mins.: then run 7 mins. more (i.e., 14 mins. altogether).
Open run-off valve for 1 min., close valve.

Rinses

(1) Water at 100°F. to a running dip of 9 ins.
Run 3 mins. after all the water is in.

(2) Cold water to a running dip of 9 ins.
Run 2 mins. after all the water is in.

(3) Cold water to a running dip of 14 ins.
Run 1 min. after all the water is in.

(4) Cold water to fill machine full
Run 1 min. after all the water is in.

The temperature of 140°F. in the wash can only be used for white overalls.

† *With acknowledgments to British Nylon Spinners Ltd.*

* *If white nylon does pick up loose dye an effective treatment is to immerse the overall in a solution containing 2% sodium hydrosulphite, 2% caustic soda and 20% Oxitol at 140°-160°F. for 15-30 mins. and follow this by thorough rinsing and re-washing.*

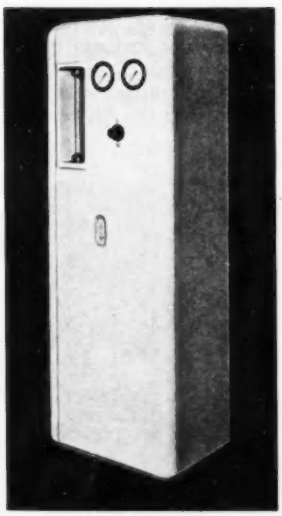
Features in a New Model Chlorinator

A CHLORINATOR of new design which incorporates the most modern materials available is announced by Chlorination Equipment Ltd. Extensive use has been made of plastic materials specially developed for chlorine and water resisting properties, in the construction of components such as the injector block, chlorine regulator, valve body and piping; and wherever metals are necessary advantage has been taken of modern developments in corrosion-resistant alloys. The cabinet is made of polyester-impregnated glass-fibre.

Only one control has to be manipulated to vary the meter reading. The principal component is the vacuum regulator assembly, which consists of the regulator and differential chambers. The flow of water under pressure through the injector produces a vacuum which extends to the differential chamber. This is connected to the vacuum regulator through the chlorine flow-meter and control valve. The throttling action of the latter reduces the vacuum which is at 35″ Wg in the differential chamber to 20″ Wg in the regulator chamber and the chlorine gas arriving there is reduced to this negative pressure. A constant differential thus exists for metering at any given reading. Manipulation of the control valve causes a float in an accurately calibrated glass tube constituting the flow-meter to take up a position adjacent to the required reading.

The top side of the regulator diaphragm is connected to atmosphere and the safety relief valves which it houses come into operation in the presence of gas under pressure or an excess vacuum caused by failure of the chlorine supply. The provision of other devices prevents back flooding and also ensures safety in the event of failure of the vacuum regulator valve.

This chlorinator, known as model C.E. is available in thirteen meter sizes ranging from maximum capacities of 0·125 to 40 lbs. of chlorine per hour with a control range of 10 to 1. It is produced in two types; type NM for manual operation and type NA for fully automatic dosing. In this latter unit a vacuum transmitter is incorporated which is responsibe to changes in flow and transmits such changes to the chlorine regulator assembly by varying the differential pressure across the control valve. The vacuum for the operation of this device is produced by an auxiliary injector connected to the low pressure water supply. An outstanding feature of the vacuum transmitter is its compact and neat design and efficient operation in comparison with equipment previously designed for the same purpose. It is available for operation by the differential taken from a Venturi or orifice plate or from a float actuated by a weir or flume. Full details may be obtained from the manufacturers, Chlorination Equipment Ltd., 129 Kingsway, London, W.C.2.



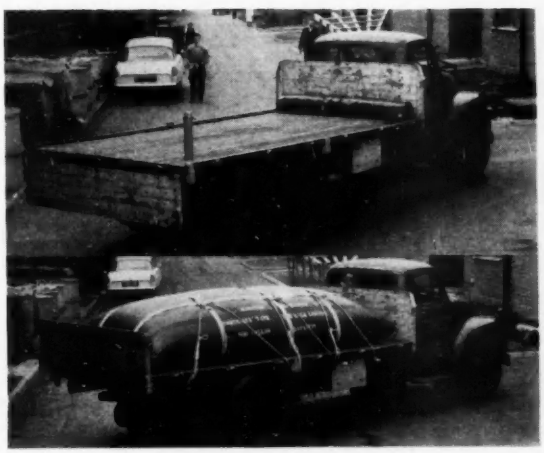
(left) The Model CE chlorinator

Significant Development in Transport of Bulk Liquids

DESIGNED to provide simple, lightweight containers for transport and storage of a wide range of liquids, the "Portolite" tanks introduced by Marston Excelsior Ltd. (a subsidiary of I.C.I.) are made from coated strong woven fabrics. Bulk liquids can be easily conveyed by normal road, rail or water transport. On the return journey the empty tank can be rolled up and the full load space used for other cargo.

The tanks may be strapped on to the flat surface of an open-sided vehicle or placed within the walls of a vehicle with sides. Maximum capacity is possible in the latter case if a tank of the right proportion is chosen. Surge can be reduced to a minimum by ensuring that little or no air is allowed to enter the tank during filling. The tank is most stable when completely full; a partly filled tank should be suitably lashed.

The tanks can be supplied with filling and emptying connections to meet customers' individual needs; the corner of the container is the most suitable place for the connection. The method of cleaning depends on the contents of the tank. Steam and detergents may be safely used, while in some cases a second fitting may help to dispose effectively of steam and condensate. Due to widely differing requirements, the fabric of the "Portolite" tank will be governed by its contents. Safety regulations applicable to particular liquids should be observed.



(right) Top photograph shows an 800 gall. tank in the stowed position and (below) loaded ready for the road

New Rag Tearing Machine Offers Double Output

A simple modification on this two-swift machine enables it to be used as a single swift unit. After being treated by the first swift the material is passed over the second swift without further processing

By N. C. GEE, F.T.I.*

THE new two-swift rag tearing machine recently put on the market by Wilson Knowles and Sons, Heckmondwike, is of considerable interest to firms engaged in the shoddy, flock and woollen industries. In those circumstances where, ordinarily, materials have to be pulled twice in order to get them thoroughly disintegrated this machine will do the job in one process and thus give at least a double output, and a better product. At the present time, when labour costs are high, and skilled machine minders difficult to get, this achievement will be much appreciated.

The first swift unit follows the accepted and well-proved practice in that the material is fed on to the travelling lattice to a pair of fluted steel feed rollers (see A, Fig. 1). These are pressurised by short levers and compression springs and driven by means of either a 1 or 2 h.p. independent steplessly variable geared motor which has a 5 - 1 ratio, (A) Fig. 2. The stepless variable feed roller drive is a great advantage because of the ease with which the precise speed of feeding to suit any one of a wide range of materials can be obtained. By turning a hand-wheel, see close-up at (A) Fig. 3, to the appropriate marking on the motor control, the rollers can be driven from 3 to 15 r.p.m., or from 4 to 20, or 5 to 25 according to the raw material being processed and the results desired. Intermediate speeds in any range can be obtained very readily by the sprocket wheel and chain final drive to the bottom feed roller. The motor unit is controlled by stop-start-reverse push buttons (B) Fig. 3, in conjunction with a feed-roller safety guard (C) Fig. 3. In the event of the operative touching the latter, the feed rollers and feed sheet stop immediately, thus preventing accidents. In addition to the variable speed drive, the well known positive top roller drive can be fitted, and choking of the feed rollers, under normal feeding conditions, is thereby practically eliminated.

The first cylinder, or swift, can be had either in 18 or 24 ins. working width, and 40 ins. dia. over teeth, see (B) Fig. 1. The lags are made in solid beech, fibre faced beech, laminated beech or in solid vulcanised fibre, as required, and the teeth available include flat, round, blunt and pointed types in tempered carbon steel, and in any counts to suit the materials being pulled. All swifts are mounted on 2½ ins. roller, or double row ball bearings designed for heavy work and wooden or steel covers can be supplied.

Ball-bearing Bitter Roller

The all-steel cover (B) Fig. 2 carries a ball-bearing bitter-roller (C) which is driven by a single V-belt from the swift shaft. This is fitted with six projecting blades and travelling at a higher speed knocks back to the feed sheet any unpulled bits thrown off by the swift. Adjustable setting screws (D) Fig. 3, are provided so that the roller can be moved closer to or further from the swift for different types of materials. An adjustable tipper plate inside the top cover (C) Fig. 1, and an adjustable backplate at (D) provide further means of separating stray bits thrown off by the swift from the pulled material and deflect them into the bit-box (E). A

Head of Textile Department, Dewsbury and Batley Technical College

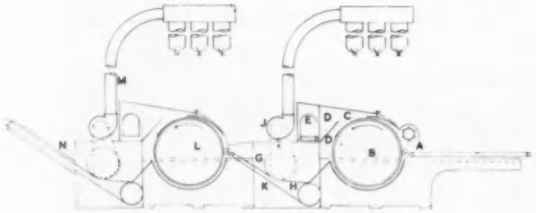


Fig. 1 (above). A, feed rollers; B, first swift; C, adjustable tipper plate; D, back bit plate; E, bit-box; G, condensing unit; H, perforated drum; J, fan; K, conveyor belt; L, second swift; M, discharge pipe; N, delivery sheet

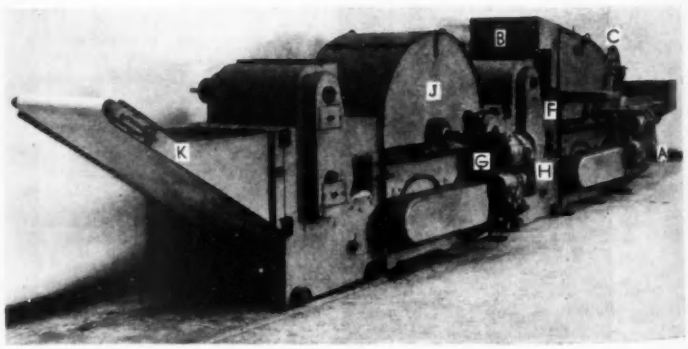


Fig. 2 (right). The Wilson Knowles two-swift rag tearing machine

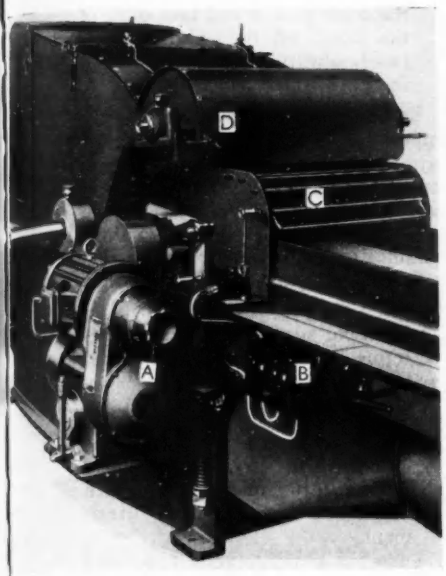


Fig. 3. Close-up of motor drive to first pair of feed rollers

transverse travelling sheet (F) Fig. 2, is fitted to the base of the bit-box which automatically deposits the unpulled bits into a box or other receptacle outside the machine.

Unlike the ordinary rag machine with a single swift where, after pulling, the material passes round the swift and is blown backwards underneath the feed-sheet, the flow of the material in this new machine passes forward to the delivery end. This is effected by the condensing unit (G) Fig. 1, which encloses a self-sealing perforated drum of unique design (H), to which the fibres are drawn by means of suction created by the fan (J) and which has an upward discharge. This fan not only controls the movement of the fibres and produces an even layer but it extracts dust and fumes which have been created by the pulling process. From this point a plastic-coated fabric conveyor sheet (K) Fig. 1, synchronised and in contact with the perforated drum conveys the material in an even layer to the second swift where it passes between a second pair of pressurised fluted steel rollers of rather smaller diameter to those in the first swift unit.

An independent steplessly variable geared motor (G) Fig. 2, drives the second pair of feed rollers and the first condensing and delivery unit, thus synchronising the delivery from the first swift to the feed of the second swift and is therefore quite independent of the rate of feeding at the first pair of feed rollers. A transparent window (H) Fig. 2, allows the operative to inspect the material as it passes from the first to the second swift (J). Thus, the exact degree of further treatment of the material can be determined at this point and an increase, or decrease, in speed of the second pair of feed rollers can be made to give any condition in the material required by the customer, and it also provides for the regulation of the second feed to give optimum results. Both swifts can be driven from one motor—a 35 h.p. motor is recommended—but separate motors for each swift can be used, if required.

Flexibility

An outstanding advantage of this machine is that it can be used, when required, as a single swift machine by means of a simple modification whereby the material is treated only on the first swift, and then passes over the second swift to the final delivery unit without further processing, see Fig. 1. On the other hand, by the addition of a single unit, the dirt, dust and fumes from many types of wastes can easily be disposed of, and at the same time the pulled material can be condensed into lap form. On the two-swift machines the second condensing unit is identical to the first with the exception of the inclined delivery sheet (K) Fig. 2, which on the standard machine gives an effective height of 4 ft. This, of course, can be made to suit individual requirements, such as when delivery to a press-baling box, or other container, is required. The use of the latest type of self-lubricating sealed bearings ensures easy running with economy of power, fosters cleanliness and obviates wastage in time, oil, or grease by the elimination of oiling points requiring periodical attention.

Air Control

A special feature of the two-swift machine is the efficient control of the movement of air inside the machine. It is well known that a swift rotating at a high speed will set up a strong current of air. With two enclosed swifts this is considerable, but by the provision of two extracting fans and suitable vertical outlet piping the air with smoke and oil fumes are thoroughly expelled from the machine and conducted out of the workroom.

Where dusty materials are being treated, the piping is led to a dust receiver, which may be located inside, or outside the building, depending on the type of receiver employed, and on site conditions.

One marked feature of this arrangement is the very clean atmosphere and improved working conditions in the pulling room and another equally important is that the pulled material is delivered in lap form at the end of the machine in a similar way to that on some carding machines. The provision of a shoddy-box is therefore obviated and the space which it would occupy saved. The fact that the machine will manipulate the processed material into a form which can be easily handled and concurrently clear itself of dust, dirt and fumes eliminates

(*continued on page 618*)

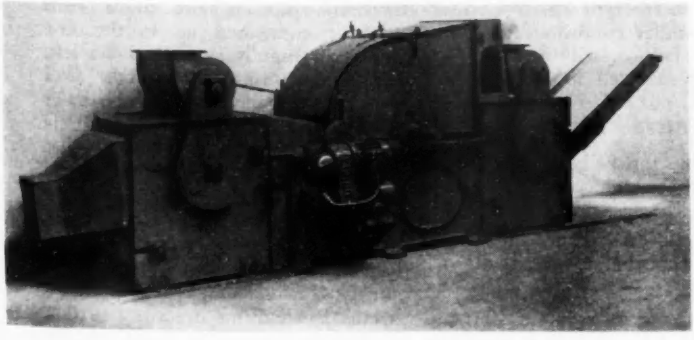


Fig. 4. Additional units necessary for the conversion of a single swift to a two-swift machine

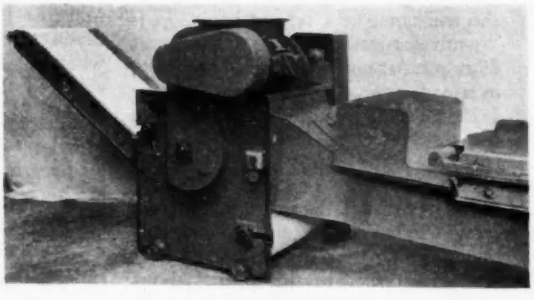


Fig. 5. Condensing unit added to a single swift machine

Nylon for Tyres

Tyres will doubtless become available in the future that are better than any we have yet had

By R. W. MONCRIEFF, B.SC., F.R.I.C., F.T.I.

THE biggest single industrial outlet for any man-made fibre is that of tyres for nylon. Tyres made with nylon reinforcement behave better in some ways, and in important ways, than those made with high-tenacity rayon; manufacturers and users have appreciated the improvement and as a result nylon is voraciously eating into the tyre market.

In 1957 some 85 million lbs. of nylon went into tyres, compared with about 63 million lbs. in 1956; in 1958 the consumption will be still greater. Whatever adversities afflict the textile industry at the moment, they do not seem to be concerned with the industrial uses of nylon: indeed the proposed erection of another factory by British Nylon Spinners has recently been in the news.

About one-third of the total tyre yarn market has now been captured by nylon, and the proportion is increasing year by year. The growth is due to the better performance of nylon tyres than high-tenacity rayon tyres.

Bruising Resistance

Laboratory tests have been made to compare the resistance of rayon and of nylon tyres to bruising. These tests were made in the laboratories of E. I. du Pont de Nemours and Co., and have been described by Swanson[1]. A "crown impact endurance" wheel test has been found to enable a good laboratory assessment to be made of the resistance of a tyre to bruising; it "involves running a tyre to failure at 35 m.p.h., at normal inflation and 15% overload, over a 3·5 ins. long plunger 1·25 ins. dia., mounted at an angle to the test wheel surface. As the tyre runs over the plunger the tread is deflected about 2·5 ins. Successive blows occur at different points on the tyre." Tyres reinforced with "super" rayons—high tenacity types especially made for tyres—would survive about 50,000 - 150,000 impacts, whereas tyres reinforced with nylon would endure 300,000 - 500,000 impacts. Furthermore, the nylon tyres contained less than 2 lbs. of cord per tyre, whereas the rayon tyres each contained about 3 lbs. of cord; this approximates to commercial practice. The superiority of the nylon tyres to bruise resistance measured in the laboratory is very great indeed — four times the life and only 60% as much fibre used.

Road tests were made on taxis to see whether the laboratory results were indicative of a commercially useful improvement. Out of 264 nylon tyres only 2 suffered impact breaks, whereas out of 265 rayon tyres, 20 suffered impact breaks; these tests were on the original tread, whereas on retread tests the nylon tyres suffered 10 breaks compared with 53 on the rayon tyres.

High Speed, High Temperature Performance

A factor which is of importance in the influence it has on the life of tyres is their resistance to bad conditions, to being used at high speeds under heavy loads, when they soon become very hot. Tests were made under a 20% overload at a speed of 75 m.p.h.; under such conditions tyre life is short; when commercial tyres were run to failure, rayon tyres averaged only 1,700 miles, whereas nylon tyres averaged 5,500 miles. In another series of tests the tyre was run under otherwise similar conditions to 3,000 miles or to failure; only 8 out of 30 rayon tyres survived to 3,000 miles, whereas 25 out of 31 nylon tyres survived the test.

The reasons for the better resistance of nylon tyres to high speeds and overload seem to be:—

(1) The better resistance to heat degradation of nylon than of cellulose.

(2) The tendency for nylon to contract when heated, so that as the tyre heats, under prolonged running, the cords pull in and take some of the strain off the rubber. It is nearly always the rubber and not the fibre which fails.

Basically, the nylon tyres have important advantages over those of rayon, advantages which show up in longer life under normal conditions of use, as well as in laboratory tests. To obtain even better results, three modifications have been made to nylon to fit it superbly for use in tyres. They are:—

(1) Multiple step stretching with intermediate annealing.

(2) Production of a new nylon which is tougher and stronger.

(3) Post-inflation, i.e. inflation of the hot tyre with air and subsequent cooling in the inflated state, which constitutes a post-curing treatment.

All the indications seem to be that the use of nylon for tyres will continue to increase.

Reference

(1) **J. M. Swanson, Recent Advances in the Industrial Use of Synthetic Fibres." Textile Research Journal," 28, 755 - 761, 1958.**

Rag Tearing Machine

(*continued from page 616*)

the usual method of emptying the shoddy-box and blow room by hand. This aspect of the new development will undoubtedly be much appreciated by the operatives. Wilson Knowles and Sons can convert the ordinary single swift rag machine widely used in the heavy woollen district of the West Riding to the two, or more, swift type without any alteration whatever to the original machine.

The additional parts required to make the conversion to a two-swift machine are shown in Fig. 4; the discharge pipe of the single swift machine connected up to the first condenser unit is shown on the left. Fig. 5 illustrates the addition of a condensing unit to a single swift machine for materials where it is considered essential to eliminate dust and fumes and also provide the shoddy, or other teazed material, in condensed form. Hydraulic brakes can be fitted to both swifts where it is deemed necessary to stop a swift quickly. Further details regarding the various mechanisms described in this article may be had on application to the makers.

New Technique in Mating Swift, Workers and Doffer of a Woollen Card

The results of an experiment designed to utilise card clothing more efficiently seem to indicate that the use of fine swifts and doffers in woollen cards is no longer essential even when processing very fine blends

By T. W. G. ASHDOWN and P. P. TOWNEND, PH.D., F.T.I.*

THE accepted ideas on the clothing of a woollen card are still very similar to those of fifty years ago with the exception of the new types of fancy clothing. It is customary to clothe the first swift with coarse wire and the second and successive swifts with progressively finer as one approaches the condenser. And it has always been the custom to clothe the workers and doffer associated with any swift with card wire of a similar count.

There are several reasons for this practice, the main one being that coarse clothing in the early stages of carding will reduce wear and tear on the card wire and so increase its life. If very fine clothing were used on the breast cylinder it would probably need constant renewal. Although coarse clothing will resist severe working conditions far better than fine, its ability to produce good carded slivers is very suspect; in fact, a scribbler clothed with coarse wire throughout produces very neppy slivers from medium and fine quality blends.

This statement can be verified by some experiments which have recently been carried out in the Department of Textile Industries at Leeds University under the auspices of the Wool Textile Research Council. These were concerned with an investigation into the actual amount of carding performed by cylinders and their rollers, clothed in the conventional manner, with wires ranging from 40/6/24 to 140/14/35, using settings normally associated with each wire. A blend of 70's lambs' wool was processed on a one swift experimental card clothed with six different lots of wire and the slivers produced were assessed for neppiness after one, three and six passages through the machine. The results are shown in Table 1.

* *Department of Textile Industries, University of Leeds.*

Table 1. Neps/gram

No. of Swifts	40/6/24	60/6/27	80/8/29	100/10/30	120/12/33	140/14/35
1	401	413	372	122	143	185
3	1,040	684	725	35·4	40	4·9
6	1,340	1,198	1,110	17	3·4	0·8

From Table 1 it will be seen that on 80/8/29 and coarser wire the number of neps per gram of web was very high after one passage through the machine and that the neppiness became very much worse on subsequent carding up to six times through the machine. Material carded on 100/10/30, and finer wire showed a reduction in neppiness after more than one carding. The chief feature of this table is the marked decrease in neppiness brought about by carding material on 100/10/30 and finer card wire, the most nep free web being that obtained from carding the blend six times through the machine clothed with 140/14/35 card wire.

The usual industrial practice and the technique adopted in the above experiment was to clothe the swift, workers and doffer with similar counts, crown and gauge of card wire. But in view of the effect of finer wires it was felt pertinent to ask whether every roller on the carding machine needed to be clothed with fine wire in order to produce good carding or if coarse clothing on some rollers and fine wire on others would produce equally good results.

Since fine card wire is more expensive, more difficult to fettle, less durable and more delicate to handle than coarse wire, it would seem to be desirable to use as much coarse wire as possible on a machine, provided that the carding power can be retained. For this reason a series of tests has been carried out to determine the relative importance of the density of pins in the clothing used to cover the swift, workers and doffer. Since experiments of this type are of a very lengthy nature the number of different combinations of card clothing had to be kept to a minimum. Eight different sets of card clothing have been tested using different combinations of 80/8/29 and 140/14/35 card clothing on swift, workers and doffer.

The machine consisted of feed rollers, licker-in, one swift, one doffer, five workers, five strippers and a fancy. The clothing for the feed rollers, licker, strippers and fancy remained constant throughout the series. The workers and doffer were set to the swift with a 26s gauge in all the tests and the speeds of all the rollers were unchanged. In the text the 140/14/35 wire will be referred to as fine (F), and the 80/8/29 as coarse (C), for the sake of brevity. Table 2 shows the experimental scheme.

Table 2

Experiment	Swift clothing	Worker clothing	Doffer clothing
1	F	F	F
2	C	F	F
3	F	F	C
4	C	F	C
5	F	C	C
6	C	C	C
7	F	C	F
8	C	C	F

The blend, processed under the conditions shown in Table 2, consisted of 70's lambs' wool to which 10% oleine, 5% of 16 skeins woollen threads and 5% of 2/32s worsted threads, 1½ ins. long, has been added. Carded webs produced after one and three passages through the machine have been assessed for woollen threads, worsted threads and nep content. The figures for thread content have been expressed as:

Weight of thread/gm. of web in milligrams

A points system of grading the different combinations of clothing according to their ability to remove neps and threads has been used, and the points shown in Tables 3 - 8 have been arrived at in the following way. Working down each column vertically (e.g. in the column for woollen thread content) the web with the lowest thread content was given 1 point and that with the next to the lowest 2 points, and so on, until the web with the highest thread content was given 8 points. The columns for worsted threads and neps/gm. were also treated in a like manner. These points were then added horizontally across the table to give the total in the "Points awarded" column; thus a low score indicates good overall carding and a high score bad carding.

Since the data are of an involved nature, it is proposed to present the discussion in three parts: (*a*) the effect of varying the swift clothing, (*b*) the effect of varying the worker clothing, and (*c*) the effect of varying the doffer clothing.

Effect of Varying the Swift Clothing

The performance of fine and coarse swift clothing used with four different combinations of worker and doffer wires is given in Table 3 for the material carded through one swift only.

A comparison of experiments 1 and 2 in Table 3 shows that using a fine swift with fine workers and a fine doffer actually removed less woollen threads than did a coarse swift used with the same fine workers and doffer, the weights of thread being 23·5 m.g. and 18·7 m.g., respectively. So far as worsted thread and nep content were concerned the figures for the two swifts were very similar, so that again, even though one cannot expect one swift only to do much disentangling, it is clear that the condition of carding in experiment 2 was no worse than that of experiment 1. A similar comparison between experiments 3 and 4 again shows that a fine swift with fine workers and coarse doffer gave similar results to those using a coarse swift, fine workers and a coarse doffer. Experiments 5 and 6 show the effect of using fine and coarse swifts with coarse workers and doffer. Once more it is evident that the webs produced were similar to each other. A difference can be seen between the results from experiments 7 and 8, when the use of a coarse swift with coarse workers and a fine doffer gave poorer carding than did a fine swift with coarse workers and fine doffer.

Table 3

Experiment	Clothing	Wt. of thread/gm. of web (m.g.)			Neps/gm.	Pts. awd.
		S.	W.	D.	Wlln. Wstd.	
1	F	F	F	23·5	28·0	134	12
2	C	F	F	18·7	27·5	138	10
3	F	F	C	14·3	18·7	124	5
4	C	F	C	10·6	20·7	112	4
5	F	C	C	23·2	28·4	144	14
6	C	C	C	25·2	29·0	148	19
7	F	C	F	33·4	28·6	148	19
8	C	C	F	37·6	31·3	168	24

S = swift, W = workers, D = doffer

From the data in Table 3, it would seem reasonable to conclude that carded webs are not greatly different when a coarse swift is substituted for a fine one, provided that the coarse swift is used with fine workers and a coarse or fine doffer. Further evidence to support this view is given in Table 4 for the same material after it had been passed through the single swift card three times.

Table 4

Experiment	Clothing	Wt. of thread/gm. of web (m.g.)			Neps/gm.	Pts. awd.
		S.	W.	D.	Wlln. Wstd.	
1	F	F	F	1·7	6·0	50	10
2	C	F	F	1·4	6·7	65	13
3	F	F	C	1·1	3·5	38	5
4	C	F	C	0·4	3·6	34	4
5	F	C	C	4·4	11·2	50	14
6	C	C	C	5·2	11·7	87	20
7	F	C	F	6·5	11·2	64	17
8	C	C	F	9·6	14·6	187	24

S = swift, W = workers, D = doffer

Comparing the same pairs of conditions, as for once through the card, it is again evident from Table 4 that a coarsely clothed swift used in conjunction with finely clothed workers and either a fine or coarse doffer, as in experiments 1 and 2, and 3 and 4, brings about a similar degree of carding. But the carding power obviously deteriorates when the coarse swift is used along with coarsely clothed workers and either a coarse or fine doffer.

Effect of Varying the Worker Clothing

By rearranging the data given in Tables 3 and 4 it is possible to demonstrate the effect of using fine or coarsely clothed workers. Table 5 shows the effect with the different combinations of swift and doffer clothing after one passage through the card.

Table 5

Experiment	Clothing	Wt. of thread/gm. of web (m.g.)			Neps/gm.	Pts. awd.
		W.	S.	D.	Wlln. Wstd.	
1	F	F	F	23·5	28·0	134	12
7	C	F	F	33·4	28·6	148	19
3	F	F	C	14·3	18·7	124	5
5	C	F	C	23·2	28·4	144	14
4	F	C	C	10·6	20.7	112	4
6	C	C	C	25·2	29·0	148	19
2	F	C	F	18·7	27·5	138	10
8	C	C	F	37·6	31·3	168	24

S = swift, W = workers, D = doffer

Comparing experiments 1 and 7 where fine and coarse workers were used with a fine swift and fine doffer it is evident that the carding power showed a considerable deterioration. The weight of woollen thread in the web rose from 23·5 to 33·4 m.g. and that of worsted thread from 28·0 m.g. to 28·6 m.g.; similarly, the nep content increased from 134 to 148 and the points awarded for these three criteria rose from 12 to 19. And it will be seen that a similar state of affairs resulted from the other three experiments, in every case coarsely clothed workers brought about a worse condition of carding than did the finely clothed. Experiments 2 and 8 are interesting in that they demonstrate that the greatest deterioration in any pair of like conditions resulted when the finely clothed doffer was used.

Table 6

Experiment	Clothing	Wt. of thread/gm. of web (m.g.)			Neps/gm.	Pts. awd.
		W.	S.	D.	Wlln. Wstd.	
1	F	F	F	1·7	6·0	50	10
7	C	F	F	6·5	11·2	64	17
3	F	F	C	1·1	3·5	38	5
5	C	F	C	4·4	11·2	50	14
4	F	C	C	0·4	3·6	34	4
6	C	C	C	5·2	11·2	87	20
2	F	C	F	1·4	6·7	65	13
8	C	C	F	9·6	14·6	187	24

S = swift, W = workers, D = doffer

For the sake of completeness Table 6 which gives the data for material passed three times through the same swift has been given. The data here supplied do no more than emphasise that the replacement of fine workers by coarsely clothed ones results in poorer carding power. And this effect

becomes even more pronounced when fine workers are replaced by coarse ones on a coarse swift as in experiments 4 and 6 and in 2 and 8.

From these results it is clear that varying the clothing used on the workers of a carding machine has a far greater effect on the resultant product than varying the clothing on the swift.

Effect of Varying the Doffer Clothing

It is commonly believed that the use of fine doffer clothing promotes better carding. The figures in Table 7 have been re-arranged to demonstrate the effect of coarse and finely clothed doffers.

Table 7

Experiment	Clothing			Wt. of thread/gm. of web (m.g.)		Neps/ gm.	Pts. awd.
	D.	S.	W.	Wlln.	Wstd.		
1	F	F	F	23·5	28·0	134	12
3	C	F	F	14·3	18·7	124	5
7	F	F	C	33·4	28·6	148	19
5	C	F	C	23·2	28·4	144	14
8	F	C	C	37·6	31·3	168	24
6	C	C	C	25·2	21·0	148	19
2	F	C	F	18·7	27·5	138	10
4	C	C	F	10·6	20·7	112	4

S = swift, W = workers, D = doffer

If one examines Table 7 and compares the data for experiments 1 and 3 it will be seen that the substitution of a coarse doffer brought about a greater disentanglement both of the woollen and worsted threads and also less nep. The weight of woollen threads/gm. was reduced from 23·5 m.g. to 14·3 m.g., the weight of worsted threads/gm. dropped from 28·0 m.g. to 18·7 m.g. and neps/gm. fell from 134 to 124; whilst the "points awarded" were 12 and 5, respectively.

And it will be seen, comparing like experiments in the same table that on every occasion the coarse doffer gave better results than did the fine one. Further evidence to support these findings is presented in Table 8 for the same material which had been processed three times through the card.

Table 8

Experiment	Clothing			Wt. of thread/gm. of web (m.g.)		Neps/ gm.	Pts. awd.
	D.	S.	W.	Wlln.	Wstd.		
1	F	F	F	1·7	6·0	50	10
3	C	F	F	1·1	3·5	38	5
7	F	F	C	6·5	11·2	64	17
5	C	F	C	4·4	11·2	50	14
8	F	C	C	9·6	14·6	187	24
6	C	C	C	5·2	11·7	87	20
2	F	C	F	1·4	6·7	65	13
4	C	C	F	0·4	3·6	34	4

S = swift, W = workers, D = doffer

Again it will be seen that in every combination of worker and swift clothing a coarse doffer improved the carding power of the machine.

By examining the "points awarded" column in Tables 3 - 8 the relative merit of the various combinations of card wires can be seen. It will be observed that the best results were obtained using a coarse swift and coarse doffer with fine workers and the worst results followed from using a coarse swift and coarse workers with a fine doffer. It is interesting to note that the conventional arrangement of fine swift, fine workers and fine doffer did not produce the best carding nor did the usual arrangement of coarse swift, coarse workers and coarse doffer give the worst carding.

From the data presented it is quite evident that the use of coarse clothing on the swift together with fine workers and coarse doffer produced webs that were comparable with those from a fine swift used in conjunction with any combination of clothing. Contrary to common theory it has been established that with all combinations of swift and worker clothing a coarse doffer produces better carded webs than does a fine one. And from this work it would seem that the use of fine swifts and doffers in woollen carding machines is no longer essential, even when processing very fine blends, since the combination of coarse swift, coarse doffer and fine workers can be expected to give results equally as those obtained with a fine swift, fine workers and a fine doffer. To carry these findings a stage further, it would seem that the clothing used on machines in the different branches of the woollen industry needs re-examining.

Acknowledgment

The authors wish to acknowledge the grant from the Wool Textile Research Council which enabled this work to be carried out.

Trade Literature

TINOLITE COLOURS. Geigy Co. Ltd., Rhodes, Middleton, Manchester. Illustrated in a new pattern card (No. 528), are a range of finely dispersed pigment pastes in highly concentrated form for printing with an oil-in-water binder (Tinolite Binder CM) on all types of natural, man-made and inorganic fibres. The Tinolite printing process is simple and economical and can be applied by hand or automatic screen and roller methods. The new card is in looseleaf form, convenient for later additions. Each colour has a page to itself with its fastness properties and pattern in two depths of shade.

* * *

CHOOSING AND USING DRESS LACE. Lace Publicity Office, 14 Queen Anne's Gate, London, S.W.1. Proving that customers who might hesitate to buy lace (mistakenly supposing it to be difficult to cut and sew) can be readily reassured, this leaflet tackles the question of wide types and bobbin nets. Step-by-step directions explain in clear language how dresses, sumptuous or simple, can be easily made, even by the beginner. Hints are given on the amount of lace needed; the most economical methods of cutting; use of backing fabrics; and various ways of finishing neckline and sleeves. Diagrams demonstrate how scalloped edgings of flouncings can be used to best advantage, and special sections deal with all-over design and bobbin nets. Copies of the leaflets are free on request.

* * *

RESEARCH AND DEVELOPMENT BULLETIN. A detailed, illustrated report of the "Analmatic" Karl Fischer Apparatus is contained in a recent edition of the *B.T.L. Bulletin*, the research progress journal published by Baird and Tatlock (London) Ltd., Chadwell Heath, Essex. This apparatus is an automatic version of the previously developed electrometric titration instrument for the determination of water by the Karl Fischer method. This method consists of titrating a water-containing solution directly with a solution of iodine and sulphur dioxide in methanol, the end point being determined when iodine ceases to be absorbed. This is observed visually or electrometrically by the "deadstop" end point.

* * *

INDUSTRIAL AND SCIENTIFIC INSTRUMENTS. Negretti and Zambra Ltd., 122 Regent Street, London, W.1. The first of two informative publications, in three languages, describes and illustrates the pressure amplifier and the gap-measuring probe. The second, the general catalogue, comprehensively surveys the company's many products and includes a number of half-tone illustrations.

* * *

LECHLER SPRAY NOZZLES. Nine principal types of spray nozzles manufactured by Ascog Ltd., 44 Theobald's Road, London, W.C.1, are illustrated in a leaflet recently released. These include the spiral type K.S. which gives minute atomisation over a hollow cone area with a dispersion angle between 40° and 90° depending on nozzle size. This type is extensively used in textiles.

* * *

TWIFLEX DISC BRAKES. An introductory brochure from Twiflex Couplings Ltd., The Green, Twickenham, Middlesex, clearly explains and illustrates the construction and operation of the Twiflex disc brake and Dunlop caliper unit. A main feature of this braking system is its inherent resistance to fade whilst withstanding repeated application with undiminished efficiency, thus enabling full advantage to be taken of the improvements in electric motor design. A list of typical applications is included.

TEXTILE MACHINERY and MILL EQUIPMENT NEWS

Fully Automatic Incline-Plane Testing Machine

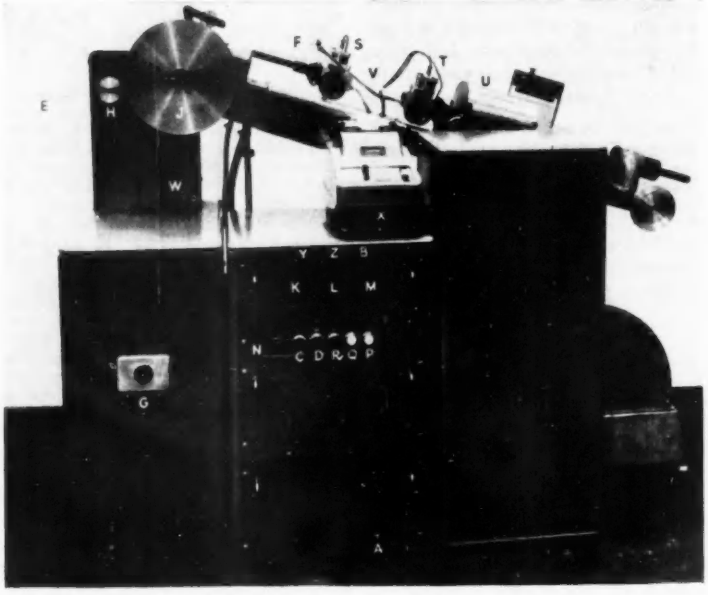
The automatic equipment is "built-in" to the basic motor-driven testing machine and continuous operation is obtained and controlled pneumatically and electronically

SCOTT Model IP-4 incline-plane testing machines are extensively used all over the world for testing tyre yarns and cords. A vital characteristic of tyre yarns is maximum physical properties with minimum deviation from standard to provide optimum performance under exacting conditions of use as components of motor tyres. Production control testing of tyre yarns must incorporate effective sampling methods in order to maintain the high standards of product required. Comprehensive testing is expensive especially in respect of the labour item of operational costs when using manually operated testing machines.

Courtaulds Ltd., producers of man-made tyre yarns, have carried out extensive research with the object of reducing operational costs of comprehensive production control testing of tyre yarns. At the same time, quality standards must be maintained, and rapid interpretation of test results is essential. The outcome of the research is the fully automatically-operated Scott Model IP-4 incline-plane constant rate of loading testing machine (illustrated). Courtaulds Ltd. have licensed Scott Testers Inc. to manufacture the new equipment and apply it to their well-known Model IP-4 testing machine for sale in world textile industry markets.

The automatic equipment is "built-in" to the basic motor-driven testing machine, and continuous operation is obtained and controlled pneumatically and electronically. Unit cabinet construction follows current methods of design. The left-hand cabinet contains pneumatic and mechanical controls with yarn measuring rollers mounted above the cabinet. Electronic equipment is housed in the centre cabinet with the tape printing adding machine unit placed on the top of it in front of the incline plane of the testing machine. On the right is the motor drive of the testing machine and a cabinet into which waste yarn (resulting from tests) is exhausted.

Centre knob G is used to control yarn feed from the measuring roller through the suction funnel F and both fixed (S) and moving (T) air-operated clamps to the waste container. This prepared the machine for starting a series of tests. Start button R is pressed to put into action the pneumatic system and the associated electronic control devices. Pneumatic



View of the full automatic Scott Model IP-4

clamps S and T grip the yarn at test sample width apart and the forward driving gear is engaged. The "plane" of the machine commences to "incline" and the load of the carriage is applied to the yarn at a constant rate. The amounts of extension and load are measured continuously by digital counting units which incorporate miniature lamps and photo-cells operated in conjunction with a grill. The load register counts in steps of 0·1 kg. to a maximum of 10 kgs. and the extension register counts in steps of 0·2% up to 50% extension.

At yarn break, a second miniature lamp house and photo-cell assembly operates and stops any further count in the storage registers. The gear box is reversed to return the machine to the starting position. At the same time, the tape printer is started and test results are printed in column form by the electric-solenoid operated adding machine (X). When the test results are printed, the electronic storage registers are cleared and the machine is restored to normal to restart to carry out the next test cycle.

Tests are made and recorded on tape in successive groups of 10 tests. Switch N sets the machine to run continuously for 10 or 100 tests, that is, for either 1 or 10 group(s) each of 10 tests. When the required number of tests is completed, the machine stops automatically. Controls C and D start and stop the machine driving motor and Q and P reset the serial number and test number counters. After each group of 10 tests is completed, the totals of each column are printed. These totals give, at a glance, the average of the completed 10 tests. Before the next group of 10 tests commence, the tape is printed with a pre-determined title and legend to include date, identity number of test machine, serial number of test and batch of yarn. Controls K, L, and M are used to re-set the date figures.

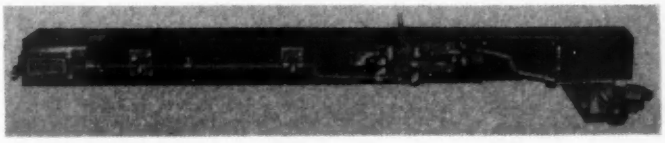
During the operation of the machine, an automatic check of the test results is made against pre-set tolerance limits. If a test result is outside the tolerance limits because, e.g. slipping of the yarn in the clamps, double or weak yarn, the machine automatically stops and Lamp Z signals the stoppage. The irregular test result is indicated on the tape by a completely blank line.

The machine continues to make up to 100 tests without manual attention, but supervision of three machines by one operator is assisted by indicating lamps Y, Z, and B. These indicate respectively, White—power is switched on; Green—machine is running normally; Red—machine is stopped.

The Scott "Tensilgram" or chart is shown on the right and may be used in the normal way for recording graphically the test curve. Initially it is used for calibration to ensure the weights loaded in the carriage of the incline-plane provide the correct range for a particular yarn to be continuously tested. The test curve is also useful in the interpretation of the printed tape results.

(The U.K. representatives of Scott Testers Inc., are Universal Winding Co., Unisel Division, Saville Street, Manchester 1.)

New Centre Weft Fork Motion

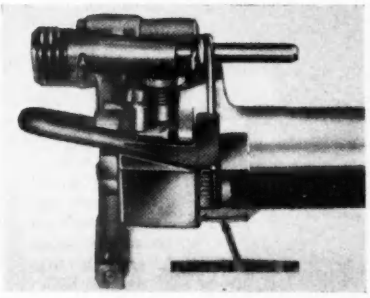


"Hudson" centre weft fork motion for modern automatic looms

DESIGNED to eliminate all broken picks and make pick-finding unnecessary on any type of fabric, the new centre weft fork motion recently added to the range of specialities manufactured by Irvin Hudson Ltd., Ingleby Street Works, Bradford 8, has much to commend it in helping to attain maximum weaving efficiency. Constructed for the Saurer and other modern automatic looms, it works on the "moving notch" principle, i.e., the knock-off assembly is perfectly stationary until the weft supply fails, when it then operates to stop the loom. Wear and tear is reduced to a minimum and there is likelihood of an alteration in setting.

The weft fork motion is driven on every pick from the breast rail of the loom, thus providing a direct and positive action to ensure maximum sensitivity. As the illustration shows the arrangement is comparatively simple and consists of very few parts. Adjustable in only a few places, the motion is easily accessible and both factors contribute decidedly to economies in maintenance costs and savings in man-hours. The motion is produced with a standard of finish equal to that on all modern automatic looms. In addition, the centre weft fork can, in most cases, be combined with the loom brake to stop on the pick.

New Technique for Weft Cutting in Automatic Weaving



Side view of the "Crown Microshave" sliding weft cutter; developed by Lupton Bros. Ltd.

CUTTING loose ends of yarn from cloth selvedges after weft changing on the loom has not been an easy problem and for some considerable time these protruding weft ends have in many cases necessitated an additional trimming operation. On view at the recent machinery exhibition, however, was a new sliding weft cutter said to have proved under test to be highly efficient and trouble-free. Known as the "Crown Microshave" it is one of the latest developments manufactured by Lupton Bros. Ltd., Accrington, Lancs.

Integral with the temple, it is self-adjusting and is designed to sever the weft tails right up to the selvedge. There is 1 in. of automatic adjustment which is ample for normal variations in width and this is carried out independently of the temple. This arrangement adjusts itself constantly to the selvedge without any supervision. The actual cutter, of new design, is available with most patterns of automatic temples and can be fitted with any of the company's standard types of temple barrels, etc.

Fine Wire, etc. Feeding Device

ALTHOUGH the Kinetrol fine wire feeder is primarily intended for unwinding fine wire at constant tension from a reel, while it is being wound on to delicate industrial, electronic or research apparatus, it may also have an application to the textile industry. The feeder stands 15 ins. high and handles the thinnest copper wire, down to ·0008 ins. dia., or nichrome down to ·0006 ins. dia. The tension may be adjusted from a minimum of 5 grammes to a maximum of 15 grammes. It will feed 46 - 52 gauge wire at 60 ins./sec. and a spring controlled model (not shown here) will feed thicker wire (42 - 46 gauge) at 240 ins./sec.

Kinetrol fine wire feeder

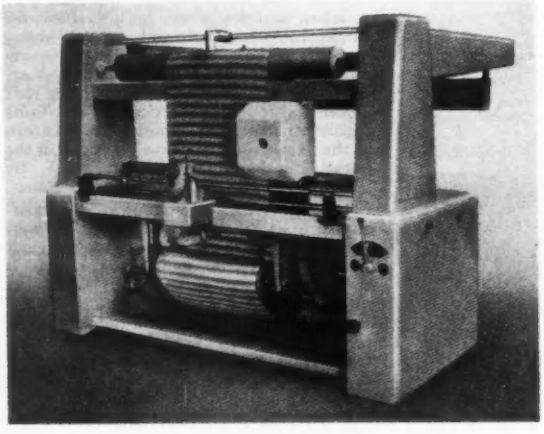
The wire is unwound from its reel by the action of winding it on to the article being manufactured. The reel is stationary on the feeder and an arm is pulled by the wire, rotating round the reel, to lead it away over a series of pulleys. Between two of these pulleys, mounted on a beam, the wire hangs in a loop, to support an adjustable jockey-weight attached to a jockey pulley. This jockey-weight applies the correct tension to the wire. It is poised over a pan attached to the end of a lever. The lever actuates a brake controlling the spinning of the rotating arm. The slightest slackening in the tension in the wire causes the jockey-weight to settle in the pan, which applies the brake to the rotating arm and restores the tension. As the tension increases the jockey-weight tends to rise, releasing the brake till the tension is correct again. In an extreme case, if the wire jams on the reel, the jockey-weight can rise several inches without increasing the tension, and gives warning of trouble. Further details will be gladly supplied by Kinetrol Ltd., Trading Estate, Farnham, Surrey.

Hand-Operated Lubricator

THE "K" type hand-operated lubricating pump made by Tecalemit Ltd., Plymouth, Devon, is now available in a specially designed reservoir, that makes it ideally suitable for application to fork lift trucks, machine tools, textile machines etc. This Bijur "K" type pump and reservoir has been evolved for external mounting. The pump is of the spring discharge type operated by raising the "T"-handle which, when released, automatically discharges oil throughout the system and shuts off the supply when completed. The output may be varied, the maximum with a stroke of 1·5 ins. being 7·5 c.c. per stroke. The output pressure is 70 lb./sq. in., and the reservoir has an oil capacity of approximately 2/3 of a pint.

The Tecalemit "K" type hand operated lubricating pump

New Automatic Selvedge Trimmer



The "Imperial" selvedge trimmer with built-in suction arrangement and facilities for different types of cloth feed

A NEW fully automatic selvedge trimming machine—the "Imperial"—built by Sam Vollenweider, Horgen, Switzerland, was exhibited for the first time at the recent textile machinery exhibition at Belle Vue, Manchester. As the illustration shows, it is entirely new in appearance and is designed to remove quickly and neatly all hanging yarns at the selvedges of cloth woven on automatic looms, also all looped yarns from the selvedges of multi-colour weft, check fabrics.

With the combined motor drive, all the elements of the loop opener and thread cutter are protected by dust-proof casings. The carriage is suspended on guide rails which ensure steady and close contact of the opener and cutter with the selvedge. The new design of the loop opener and thread cutter opens and cuts yarns from

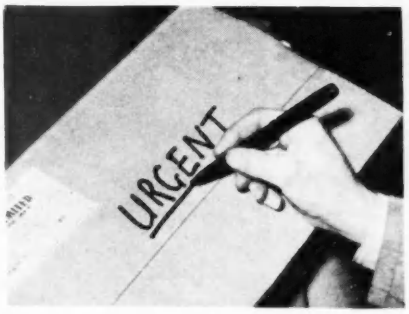
$\frac{5}{16}$ in. to 11$\frac{3}{4}$ ins., and an automatic seam let-through motion is controlled by a photo-electric cell. Modern and streamlined, the welded frame encloses (at one side) all the driving elements and at the other a powerful exhaust fan and filter bag. Vertical cloth flow makes it easy for the operative to work and the cloth batch carrier built in between the frame makes the machine very accessible whilst occupying less floor space. The machine can be supplied with a cloth feed to suit individual requirements, e.g., with a batch-carrier or wooden platform for folded cloth, or a cloth condenser for continuous work. (The British agents are Livesey and Aspinall Ltd., Cumberland Street, Manchester).

Dry Marker Saves Time

A PRECISION-MADE instrument for writing, marking, or stencilling on practically any kind of surface and a time saver for warehousemen, storekeepers, etc., is announced by Ofrex Ltd., Ofrex House, Stephen Street, London, W.1. It is a boon for making graphs, marking files and folders; parcels and postal packets.

The marker gives a controlled, even flow which is maintained without the use of any valve mechanism inside the barrel. Refilling takes 15 secs. and is clean and simple.

The "nib" of the marker is made from compressed felt and various shapes are available for different types of marking from "fine" to "very broad." The marker is charged with "Rapidry" ink, a fluid which dries practically instantly on paper, card, cloth, wood or any slightly porous surface and very quickly upon hard surfaces such as metal, glass, plastics, etc. The set comprises an unbreakable duralumin marker pen and spare chisel, round, T-shaped and fine point nibs, all easily interchanged and a 2 ozs. can of ink in colour to choice. The markers are supplied in black, black/red, black/blue, black/green and "Rapidry" inks in the translucent colours: black, red, blue, green, brown, orange, purple and yellow.



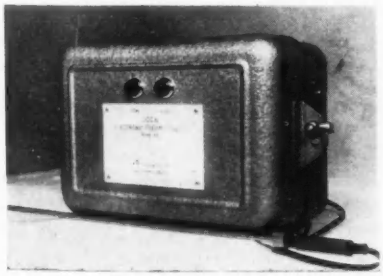
(left) This new marker, with variable style nibs maintains a remarkably even flow

Electronic Thermo-Switch

AFTER considerable research and development work, A. M. Lock and Co. Ltd., Union Street, Oldham, have just released their new electronic thermo-switch. The temperature elements, interchangeable and extremely sensitive, consist of a platinun winding, housed in a thin stainless steel tube; the element can be located remotely from the control unit. The instrument is designed to maintain temperatures at a pre-set value which gives immediate relay action for any tendency to deviate from this value. Variation of temperature results in the platinum sensing element producing an out-of-balance signal in the electrical bridge network, either in or out of phase with the bridge voltage, depending upon the sense of the temperature change. The signal is amplified and applied to a phase sensitive detector which operates a heavy duty control relay, making or breaking, according to whether the measured temperature is lower or higher than the pre-set position on the control knob.

This instrument has been carefully designed and the makers claim the following advantages:—

(1) Long term calibration accuracy.
(2) On/off control action on a temperature differential of ± 0·1% of range coverage.
(3) Available for use in temperature range — 200°C. to + 500°C.
(4) Fail to safety "high temperature" or "low temperature" as required.
(5) Operates with interchangeable resistance elements.
(6) "Plug-in" electronic chassis for easy replacement.
(7) Accurate control setting knob located behind instrument door provides a locking device to prevent unauthorised interference.



A. M. Lock and Co. Ltd., electronic thermo-switch (Type TS1)

Limit Switches with Ball-Bearing Roller Arms

SQUARE D LTD., 100 Aldersgate Street, London, E.C.1, have recently introduced, as an addition to their Class 9007 Type A limit switch range, a selection of roller arms incorporating lifetime lubricated ball bearings. These roller arms are fully interchangeable with the standard types of roller arms and are specially designed for high production applications on machine tools and similar machinery involving continuous rolling contact of limit switch arms with the cam track. Arms are available in 1$\frac{3}{8}$, 2, 2$\frac{1}{2}$ and 3 ins. lengths. The roller diameter for all models is $\frac{3}{4}$ ins.

(right) Limit switch with roller arm. Square D Ltd.

ICI

ANTISTATIC AGENTS

FOR

MAN-MADE FIBRES

at all stages of processing
from carding to finishing

CIRRASOL AR
CIRRASOL SF 200
LUBROL W
LUBROL MOA
LISSAPOL NX

Applicable from aqueous solutions, from emulsions, or together with oils to

staple fibres and yarns for

carding
spinning
and subsequent operations

filament yarns for

winding
warping
knitting
braiding
weaving

Full information on request.

IMPERIAL CHEMICAL INDUSTRIES LIMITED
LONDON, S.W.1. ENGLAND

D.886

THE TEXTILE
COLOURIST & FINISHER

New Dyeing and Finishing Processes of More Than Usual Interest

Recent developments include a flameproofing process for viscose rayon, a new wetting agent for mercerising liquors, anti-static treatment of synthetic fibres, waterproofing cotton goods with silicones, and new dyes for wool, etc.

By B. C. M. DORSET

THE flameproofing of viscose rayon material has received attention as a result of the general interest in making all kinds of textile materials resistant to fire and less dangerous in use. Recent statistics have shown that much loss of life, particularly infants and children, arises from the garments and textiles in common use catching fire and there is a need for some simple method for making these less ready to ignite by contact with an electric fire or a flying spark from a coal fire. It is comparatively easy to make or render articles fireproof for industrial uses but more difficult to give the same fireproof properties to articles of apparel which have to possess properties such as softness of handle, lustre, good draping characteristics, fastness to washing or dry cleaning, and generally satisfy the requirement of being attractive and comfortable in wear.

Viscose rayon goods, being composed of regenerated cellulose, are of course just as inflammable as cotton and linen; in raised or pile material form they can burn with surprisingly rapidity since the oxygen necessary to combustion is close at hand entrapped between the brushed-up fibre ends. When it is attempted to flameproof such rayon goods by the usual methods as, e.g., by the formation or deposition of oxides of such metals as antimony, zirconium, tin, etc., with the addition of supplementary agents such as a chlorinated hydrocarbon capable of liberating hydrochloric acid during combustion, a borate, pyrophosphate, etc., it is often found that those treatments most effective are just those which give a flameproofing effect not fast to repeated washing or to dry cleaning. According to B.P. 795,133 which covers an American discovery, flameproofing of viscose rayon can be effectively secured by taking advantage of the possibility of incorporating in the rayon fibres during manufacture a substance which can later be caused to combine with metal compounds having good flameproofing properties and, arising from this special manner of forming flameproofing compositions within the fibres thus ensure that the resulting flameproof finish is fast to subsequent washing.

The flameproofing process thus recommended consists of adding to the viscose spinning solution a substance such as carboxymethyl cellulose (readily soluble in the alkaline viscose) and then spinning the filaments in the usual manner with the carboxymethyl cellulose left in an insoluble state within the fully formed filaments. Since this substance contains carboxyl (COOH) it is capable of readily reacting with metal compounds subsequently applied to the fibres preferably before these have been dried following the usual spinning and purification treatments involved in the manufacture of viscose rayon. Potassium dihydrogen pyro-antimoniate of formula, $K_2H_2Sb_2O_7.6H_2O$ is a satisfactory metal compound to use and the following typical treatment is based on its use.

First, viscose rayon filaments are produced so as to contain 0·8% of a high viscosity carboxymethyl cellulose and before drying (as a stage in their manufacture) they are (in the form of yarn) soured with 10% sulphuric acid solution to ensure that this carboxymethyl cellulose is present with its carboxyl groups free. The yarn is then immersed in a 6% aqueous solution of the potassium dihydrogen pyro-antimoniate at about 55°C. to bring about the combination of this substance with the carboxymethyl cellulose and produce the flameproof finish.

Experience in operating this process has shown that the flameproof effect can be accentuated by either further treating the viscose rayon yarn or other material with 1% sulphuric acid at 45 to 60°C. for about 30 mins. or by further treating it with another metal compound, e.g., one of zirconium. Thus the viscose rayon yarn treated with a 6% solution of potassium dihydrogen pyro-antimoniate as described above may (without intermediate washing or drying) be immersed for 30 mins. at 55°C. in a 20% solution of ammonium zirconyl carbonate and then be rinsed and dried. The resulting yarn has excellent flameproof properties and if ignited so as to produce a char this does not

afterglow. The flameproof effect is remarkably fast to washing.

New Wetting Agent for Mercerising Liquors

Pinonic acid can be obtained from alpha-pinene which, in its turn, can be extracted as a major constituent from turpentine has recently been found by Summers and Hedrick (Amer. Dye. Rep., 1958, **47**, 571) to show excellent wetting powers when mixed with butyl cellosolve and added to concentrated solutions of caustic soda as employed for the mercerisation of cotton yarns and fabrics. It is necessary to use the butyl cellosolve

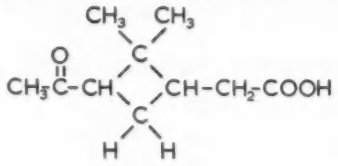


Fig. 1

since this increases the wetting power of the pinonic acid which incidentally has the formula set out in Fig. 1. Butyl cellosolve is the butyl ether of ethylene glycol and is a readily available chemical while pinonic acid is made by the oxidation (with potassium permanganate or ozone) of alpha-pinene (see Loeblich, Magne, and Mod; Ind. Eng. Chem., 1955, **47**, 855).

The manner in which butyl cellosolve assists the wetting power of pinonic acid is governed by the proportions in which it is used and the curve in Fig. 2, which shows the wetting times of a mercerising liquor containing a mixture of butyl cellosolve and pinonic acid with rising content of the latter substance, suggests that the most effective mixture of these two

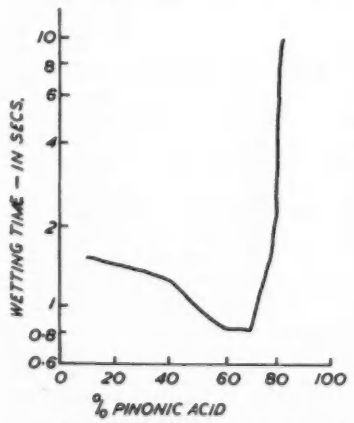


Fig. 2. Curve showing the wetting times for cotton when entered into a caustic soda mercerising liquor to which has been added a mixture of butyl cellosolve and pinonic acid containing a rising proportion of the latter.

substances is one which contains 60% of pinonic acid.

It is known that a mixture of butyl cellosolve and cresylic acid (derived from coal tar) is also a good wetting agent for use with mercerising liquors and comparison of such a mixture with one containing pinonic acid instead of cresylic acid indicates that these two latter substances have about the same wetting power when used in admixture with butyl cellosolve. Facts concerning the commercial production of pinonic acid suggest that this turpentine derivative could be produced as cheaply as cresylic acid and so compete with this.

From the formula given above it is seen that pinonic acid is a mono-basic acid while also containing a carbonyl (CO) group. This carbonyl group in its enol form can form a sodium salt in addition to that formed from the carboxyl group and Summers and Hedrick believe that the wetting power of pinonic acid is intimately connected with this carbonyl group. This view is supported by the fact that comparable monobasic acids having C_8, C_{10} and C_{12} carbon chains have no appreciable wetting power in mercerising liquors; these acids have no carbonyl group. It is an interesting point that the most satisfactory mixtures of butyl cellosolve with pinonic acid and cresylic acid from the viewpoint of raising the wetting power of a mercerising liquor are just those which have a wetting power practically unaffected by the temperature of the mercerising liquor whereas unsatisfactory mixtures have their wetting power much reduced with a rise of temperature.

Anti-Static Synthetic Fibres

Although it is now common practice to treat synthetic fibre materials with compositions to make them less liable to give trouble in processing due to static formation it would appear preferable in many instances to manufacture the fibres so that they have inherent anti-static properties and thus not require any subsequent treatment. An attempt in this direction is disclosed in B.P. 796,800 and it would appear now to be possible to manufacture directly polyamide, polyester, and polyacrylonitrile fibres having marked anti-static properties by making suitable additions to the polymer at some suitable stage before spinning it into fibres.

This possibility arises from the discovery that if 0·1 to 5% of at least one substituted methane or ethane derivative which forms a free radical having trivalent carbon is added to the monomer used for the production of fibre-forming polymers or copolymers then these fibres are found to have a reduced tendency to acquire an electrostatic charge. The extent of this improvement can be judged by the higher electrical conductivity conferred on the fibres since the tendency of fibres to accumulate static electricity is usually in inverse proportion to this conductivity, and in turn, this latter property is in inverse proportion to the electrical resistance of the fibre. Experience has shown that if the electrical resistance of a fibre is higher than 5×10^9 ohms then it is likely to give static troubles during winding, weaving, knitting, and other forms of processing. Many of the synthetic fibres have an electrical resistance of 1×10^{12} to 1×10^{13} ohms. By modifying the manufacture of such fibres as indicated above this high electrical resistance can be lowered to an acceptable value of about 1×10^9 ohms.

Among the methane and ethane derivatives found useful are triphenyl chloromethane, triphenyl carbinol, diphenyl mono-diphenyl methane, phenyl-di-phenyl methane, hexaphenyl ethane, hexa-(para-diphenyl) ethane, and tetraphenyl-di-diphenyl ethane. It is convenient that these additives are soluble in such solvents as alpha-chloronaphthalene and 1 : 2 : 4-trichlorobenzene which are also solvents for several monomers used in the production of fibre-forming polymers; such common solubility allows admixture of the additive to the monomers immediately previous to the polymerisation stage. Incidentally, it has also been found that these solvents present during the polymerisation of the monomers assist the production of fibre-forming polymers having the desired low electrical resistance.

Used in formation of fibre-forming polymer substituted methane or ethane derivatives cannot be washed out and are ultimately present in the fibres. The following two examples show how polyester and polyamide fibres having a much reduced tendency to accumulate static electricity can be formed. In the case of "Terylene," Dacron or other polyester fibre the polyester can be formed by heating 100 grams of dimethyl terephthalate containing an added 20 grams of zinc oxide (a catalyst) and an equimolecular proportion of ethylene glycol in a nitrogen atmosphere to prevent oxidation until a clear solution is obtained. Then 2 grams of hexaphenyl ethane are added and the mixture is further heated for 3 hours at a temperature

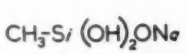
rising gradually to about 200°C. at normal pressure and until substantially no more methyl alcohol is split off. Further heating is then effected at 265°C. and finally the heating is conducted in vacuo to remove the last traces of excess of ethylene glycol. Thus is obtained polyethylene terephthalate suitable for melt-spinning into fibres having the low acceptable electrical resistance of about $0{\cdot}1\times10^9$ ohms so that they produce no static difficulties during their subsequent manipulation. Polyamide fibres having an electrical resistance of about 1×10^9 ohms can be spun from the polyamide obtained by heating together 113 grams of caprolactam, 1·2 grams of ϵ-amino-caproic acid, and 8 c.c. of distilled water with the further addition of 1·2 grams of diphenyl-mono-diphenyl methane. Condensation is completed at about 235°C. within seven hours.

Waterproofing Cotton Goods with Silicones

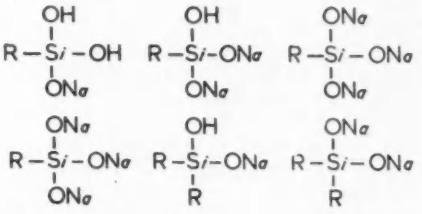
Silicones (organo-polysiloxanes) are widely used for waterproofing all kinds of porous materials including textile fibres by first padding the material with the silicones and then heating to a high temperature to bring about complete polymerisation of the silicone. Two disadvantages are encountered. The high temperature treatment can damage the textile material, while the resulting waterproof finish may lack fastness to washing in liquors containing detergents and alkaline soaps. According to B.P. 796,141 these disadvantages may be largely avoided, however, in a new method of treating the textile goods with a solution of an alkali metal siliconate and then with a solution in an organic solvent of a silicone containing a polymerisation catalyst or by a treatment in which these components of the waterproof finish are applied in the opposite order. A final high temperature treatment is not required.

The alkali metal siliconates that come into consideration for such a treatment are derivatives of organo-silanols and the metal present is generally sodium so that such siliconates will be of the types given in Fig. 3 in which *R* is a radical such as methyl, ethyl, butyl, and the like. A useful siliconate of this kind is sodium methyl siliconate having the formula given in Fig. 4.

Suitable aqueous solutions of such siliconates should contain about 1 to 5% of combined SiO_2 and since they are alkaline it is advisable to reduce their alkalinity to about pH 8. The

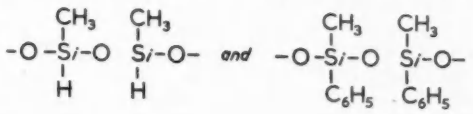


(above) Fig. 4



(right) Fig. 3

silicones used are chiefly the methyl and methyl phenyl silicones and these are polymers in which the silicon atoms are linked by oxygen atoms thus conforming to the types in Fig. 5. Their



(right) Fig. 5

degree of polymerisation must be reasonably low in order that they may be soluble in readily available organic solvents (for example, white spirit) although only a 1 to 2% solution is normally required. Those silicones in which the ratio of methyl (or methyl phenyl) to silicon is from 1·3 to 1·9 are most suitable to use in this waterproofing process. The polymerisation catalysts for the silicone may be an alkyl titanate such as propyl, isopropyl, octyl, or stearyl titanate and among these butyl titanate is especially suitable.

In the waterproofing treatment it is advisable to dry the textile material after application of each component. This is exemplified by the following example. Cotton gabardine fabric is desized and then treated with a solution of sodium methyl siliconate (corresponding to a concentration of 2·7% of combined SiO_2) buffered with acetic acid so as to be neutral to phenolphthalein; the fabric is then mangled and dried under moderate temperature conditions, say at a maximum temperature of 90°C. The dry fabric is then immersed for 15 mins. in a silicone solution having the following composition:—

Methyl phenyl silicone having a ratio of (CH_3 + C_6H_5 to Si = 1·6 and a ratio of C_6H_5 to CH_3 + 1·7)	2	parts
n-Butyl titanate ..	0·5	,,
Liquid paraffin	2	,,
White spirit	95·5	,,

After mangling and drying at 110°C. the fabric is hot ironed to complete the waterproof finishing. It is possible to test the waterproof effect in a Schmerber apparatus by measuring the pressure of water which must be applied to one side of the fabric in order to cause three drops of water to show on the opposite side. Fabric treated as above required a pressure of 215 mm. over an area of 100 cm.² of water. After such fabric had been well washed for 10 mins. at 90 to 95°C. with a soap-soda solution the retained waterproof finish required a water pressure of 147 mm. thus indicating a good degree of permanence.

It has also been found that if the fabric is treated as one stage of the waterproofing treatment with a solution of zirconium, thorium, or lead salt the resulting waterproof effect is considerably enhanced. Thus the cotton gabardine fabric waterproofed as above described except that it was initially padded with a 1% of zirconium nitrate and dried before treatment with the sodium methyl siliconate and the methyl phenyl silicone solutions required a water pressure of 335 mm. in the test also described above—an increase of 50% in the effectiveness of the waterproofing.

Improvements in Dyeing "Orlon"

Difficulty has been experienced in dyeing "Orlon" fibres owing to their poor affinity for dyes. This applies to cationic dyes which have recently been developed for dyeing "Orlon." Because of these difficulties filament "Orlon" has been at least temporarily abandoned in favour of the staple fibre "Orlon" 42 and lately a modified brand of this latter has come into production having the advantage that it has a higher affinity for cationic dyes than the original "Orlon" 42. However, with both types of "Orlon" 42 it has proved most difficult to produce level shades unless a dye retardant is employed in the dye liquor and it is possible for the added cost of this retardant to equal that of the dye so that some improved means of dyeing this type of fibre has become urgent. According to Vogel, De Bruyne and Zimmerman (Amer. Dye. Rep., 1958, **47**, *P* 581) some progress in this direction is now being made as a result of the discovery by the

American Cyanamid Company of a new type of their Calcozine Acrylic dyes which has some very interesting dyeing properties. It now appears possible to dye both the older and newer types of "Orlon" 42 levelly without the use of a dye retardant and so not only obtain improved dyeings but also at a considerably lower cost.

In dealing with the ideas underlying the colouring of "Orlon" with cationic dyes (these are based on the well known early discovered basic dyes such as Malachite Green, Methyl Violet, Crystal Violet, etc.) it is useful to recall the theory of their application and also their absorption into the fibres such as results from the researches of Glenz and Beckmann (Textilber., 1957, **38**, 296). These workers found that the German made polyacrylonitrile fibres Pan and Dralon absorb cationic dyes on special anionic sites and they further found that the saturation value of these sites was 37 millimoles of dye per kilogram of fibre—quite a low value. Their conclusion is based on a thermodynamic study of the dyeing process. Following along these lines Vogel, De Bruyne, and Zimmerman have similarly found that the dye saturation values for the older and the new "Orlon" 42 (American made) are 31 and 43 millimoles of dye respectively.

The idea that cationic dyes are absorbed into Orlon fibres on specific anionic sites within the fibres arises from a study of the equilibrium absorption curves obtained from dye absorption data resulting from extending the application to "Orlon" 42 fibres for a prolonged period and until no further dye absorption takes place. Using the three cationic dyes Methyl Violet, Malachite Green and Calcozine Acrylic Violet and plotting the reciprocal of the concentration of dye in the fibre against the reciprocal of the concentration of dye remaining in the exhausted dye liquor Vogel and his colleagues obtained the straight line plots shown in Fig. 6. These straight lines can all be extended to pass approximately through the same point on the horizontal to give the dye saturation value of 31 millimoles of dye per kilogram of fibre. If it be assumed that the molecular weight of the Orlon fibre molecule is 75,000 then it can be calculated from the dye saturation value that there are two dyeing sites per Orlon molecule thereby indicating that there is one site at each end of the molecule. As soon as these molecular terminal dyeing sites are occupied by dye the fibre

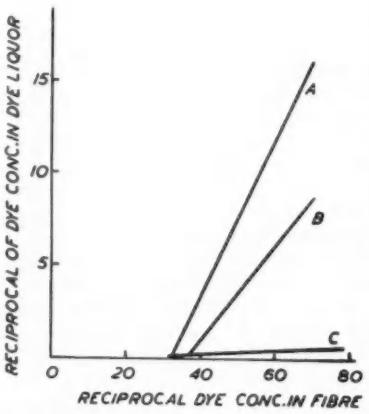


Fig. 6. Curves showing the equilibrium during dyeing Orlon with (A) Methyl Violet, (B) Malachite Green, and (C) Calcozine Acrylic Violet between the reciprocals of the dye concentrations in the fibre and the dye liquor.

is saturated and no more dye can be absorbed.

From this point attention can be given to the manner in which cationic dyes are absorbed by Orlon. In Fig. 7 are shown the rates at which the three cationic dyes Malachite Green, Methyl Violet, and Calcozine Acrylic Violet are absorbed during 2 hours of dyeing with the dye liquor at pH 4 and 97°C. and with no dye retardant present to modify the absorption of the 0·5% of dye present. Comparison of the curves shows that Calcozine Acrylic Violet is absorbed most rapidly but that at the end of about 2 hours all three dyes are absorbed to about the same degree. However, at the end of 2 hours whereas the Calcozine Acrylic Violet curve is flat or horizontal thereby denoting that no further absorption will take place, the curves for the other two dyes are still rising so that by prolonging the dyeing period they will be further absorbed and thus ultimately be absorbed to a greater extent than Calcozine Acrylic Violet. Otherwise expressed the curves

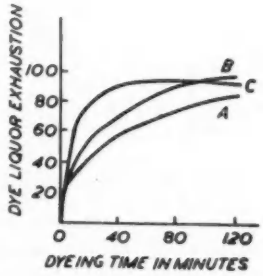


Fig. 7. Curves for (A) Methyl Violet, (B) Malachite Green and (C) Calcozine Acrylic Violet (all cationic dyes) and showing the rates of absorption by Orlon 42 when dyed at 97°C. without the presence of a dye retardant in the dye liquor

show (as do those also in Fig. 6) that Calcozine Acrylic Violet has but a relatively low affinity for "Orlon" in spite of the fact that it is rapidly absorbed while the other two have a relatively high affinity although being rather slow-dyeing. Calcozine Acrylic Violet is thus characterised in being rapid dyeing with but poor degree of absorption. Examination of cross sections of dyed "Orlon" fibres has found that whereas Methyl Violet and Malachite Green give "ring dyeing" (i.e., the dye penetrates only the outside layer) Calcozine Acrylic Violet gives a uniform colouring throughout each fibre thus penetrating the innermost parts.

From the facts elucidated concerning the difference between Calcozine Acrylic Violet and both Malachite Green and Methyl Violet regarding the manner in which they are absorbed into Orlon it becomes apparent that the level dyeing of this fibre will be more likely to be obtained as the dye is more rapid dyeing and also as it is has a lower affinity for the fibre but is able to penetrate it more freely. The slower dyeing dyes showing a greater affinity but less able to penetrate the Orlon fibres will tend to give less level colourings. Following this conclusion it has become possible to discover new Calcozine Acrylic dyes, e.g., Calcozine Acrylic Red and Orange which have the good dyeing properties of Calcozine Acrylic Violet.

Vogel, De Bruyne, and Zimmerman put forward interesting views concerning the mechanism by which very high and very low affinity dyes (represented by say Methyl Violet and Calcozine Acrylic Violet dyes respectively) are absorbed by Orlon 42 and which suggests the reason for their different dyeing characteristics—ring dyeing and through-dyeing. They point out that the high affinity dye strikes rapidly on the surface of each fibre and is tenaciously held on the surface dyeing sites to produce a thin ring of dyed fibre so that as the dye liquor penetrates further into the fibre interior it has but a very small residual content of dye and thus cannot impart much colour to the next innermost parts of the fibre. When the next wave of dye liquor passes into the fibre it strikes rapidly and again forms a thin ring of dyed fibre immediately below the outer one already formed. Thus, in the application of such a dye there is a succession of struggles by the dye to penetrate into the interior but each struggle is largely frustrated by a too ready fixation of the dye on the dyeing

sites near to the outer surface of the fibre—penetration to the centre of the fibre beyond an outer dyed ring can thus be prevented. By contrast with a very low affinity dye the dyeing sites nearer to the outside of the fibre are not immediately saturated owing to low equilibrium exhaustion and so the dye travels further into the fibre interior before becoming exhausted of its dye content and so much so with each new wave of dye liquor that the dye does reach the interior and so a uniform colouring throughout the fibre is finally attained.

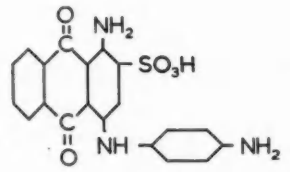
Vogel, DeBruyne, and Zimmerman also point out that a low affinity dye usually has greater migratory power than one with a high affinity and as is well known level dyeing of a textile material is greatly assisted by using dyes having high migratory power. It would appear that the way is now clear for a further alleviation of the dyeing difficulties associated with Orlon and other fibres made from polymers having a high proportion of acrylonitrile—by the search for dyes having the particular dyeing properties discussed above.

New Dyes for Wool and Other Nitrogenous Fibres

A group of new dyes which are applicable in weakly acid dye liquors to wool particularly and also to nylon and polyurethane fibres has been disclosed in B.P. 796,330 and such dyes are of the acid anthraquinone type containing an aromatically bound acylamine group, the acyl residue of which is derived from an aliphatic halogen-carboxylic acid which advantageously is a beta- or alpha-chloro-carboxylic acid; it is desirable that such dyes should also have a single sulphonic acid group to confer water-solubility.

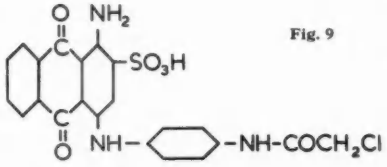
These acid anthraquinone dyes containing the required type of acylamine group once or several times can be made from dyes which contain primary or secondary amino group directly bound to an aromatic neucleus of the dye by acylating such amino group with an aliphatic halogen carboxylic acid halide or anhydride (preferably with a chloro-carboxylic acid halide having at most three carbon atoms) employing the usual methods. Thus the dye represented by the formula in Fig. 8 may be acyalated with chloracetyl chloride to give one

Fig. 8



of the new dyes having the formula given in Fig. 9.

Fig. 9



This greenish blue dye is preferably applied to wool in a dyebath having a pH of 5·5 to 7·5 during the greater part of the dyeing period, and under such conditions it will dye very levelly and yield a shade which is quite fast to washing and fulling. Many dyes of this new type can be readily prepared and they are mostly blue to greenish blue. The formulae of two other typical dyes of this kind are given in Figs. 10 and 11.

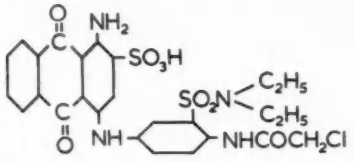


Fig. 10

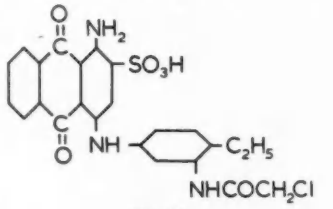


Fig. 11

Distinguishing Between Nylon and "Terylene"

Very useful information is given in Ciba Review No. 127, July, 1958, page 30 concerning differences between nylons 6, 66, and 11 and polyester fibres such as "Terylene," and here attention is drawn to tests for distinguishing between ordinary nylon 66 and "Terylene." Since these two obviously differ in chemical composition by reason of nylon 66 containing nitrogen while "Terylene" does not, one test at once suggests itself, i.e., fusion of the fibres with metallic sodium, when any nitrogen in the fibre will be converted to sodium cyanide, readily detectable by conversion to Prussian Blue. In this test, the dry fibre is placed in a test tube together with a small piece of sodium (freed from the petroleum under which it is usually stored) and heated in a gas flame. The red hot tube is then dropped into a beaker of water so that it cracks and the sodium cyanide is able to dissolve out. On adding ferrous sulphate and acidyfying with hydrochloric acid and boiling gently the liquid will soon assume a deep blue colour due to the presence of suspended Prussian blue (ferro-ferricyanide). It is advisable to protect the eyes with goggles when carrying out this test.

In another test, use is made of the fact that the polyamide fibre contains amino and imino groups whereas the polyester fibre does not. Some of the fibres should be placed in a white porcelain dish, covered with a few crystals of phenol, and moistened with a few drops of sodium hypochlorite solution containing at least 3% of active chlorine corresponding to the alkalinity of a 4% caustic soda solution. An intense bluish green colouration will soon develop if the fibres are of nylon—"Terylene" fibres give no colour.

It is not possible to distinguish between the two types of fibres by examination under a microscope since both fibres are melt spun and thus have a smooth cylindrical form. A burning test can also be inconclusive since both types of fibre give a hard white melt. But if the fibres are dry distilled by heating within a test tube then by means of moist litmus paper it can be determined if a polyamide fibre is present since this will yield basic vapours capable of turning red litmus paper blue while polyester fibres will yield acid vapours which turn blue litmus paper red.

Nylon and "Terylene" have different solubilities in various organic solvents and mineral and organic acids, so that tests based on this can be useful. The data in Table I will be found useful in this connection:

In carrying out such tests it is recommended to work with very little of the fibre material and a comparatively large amount of the solvent or other reagent.

Table 1

Reagent	Nylon 66	"Terylene"
80% Phenol	Soluble	Insoluble—cold Soluble—hot
Formic acid	Soluble	Insoluble—cold and hot
Conc. hydrochloric acid	Soluble	Insoluble—cold and hot
Conc. nitric acid	Soluble	Insoluble—cold and hot
Conc. phosphoric acid	Dissolves slowly	Insoluble—cold and hot
Glacial acetic acid	Insoluble—cold Soluble—hot	Insoluble—cold and hot

1835 1845 1855 1865 1875 1885 1895 1905 1915 1925

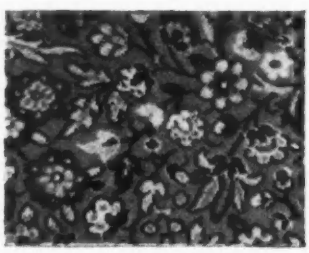
WEAVING *through the years..*

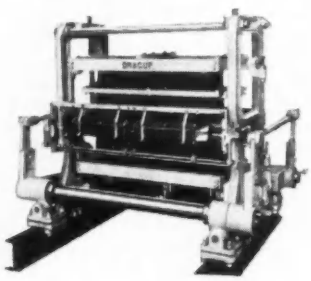
1935 1945 1955

1959

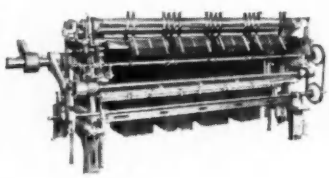
In the year 1825 Samuel Dracup founded a Jacquard Machine business destined to become world-wide in importance. The textile industry of the world now acknowledges that Jacquard machines by DRACUP are the finest obtainable. They step up production, reduce operational overheads and have a range of pitches and capacities to meet all purposes.

We invite you to weave better, faster and cheaper with Dracup Jacquards.

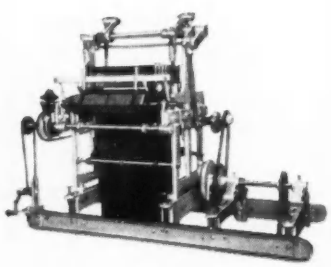




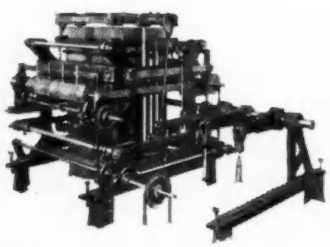
Heavy duty matting Jacquard for SISAL and COIR matting. Available in all sizes up to 24/4.



8/4 Single Wilton Jacquard for high speed production. Machines also available for Double Wilton carpets. Both types supplied any size in any pitch.



New type coarse pitch double lift single cylinder Jacquard. Available in all standard sizes. Double cylinder machines of similar design also available.



3-position Moquette Jacquard for all normal moquette weaves and special float effects.

EVERY DRACUP JACQUARD IS BACKED BY OVER 130 YEARS EXPERIENCE

JACQUARDRACUP

SAMUEL DRACUP & SONS LTD

THE BRITISH JACQUARD PIONEERS Established 1825

LANE CLOSE MILLS · GREAT HORTON · BRADFORD 7 · YORKSHIRE
TELEPHONE: BRADFORD 71071-2 · TELEGRAMS: "HARNESS, BRADFORD"

The Diazo Reaction Today

Abstracts from the papers given at a recent one-day symposium held to commemorate the centenary of the discovery of the diazo reaction by Peter Griess

OPENING a one-day symposium held recently in Manchester, on "The Diazo Reaction Today," organised by the Society of Dyers and Colourists, Mr. J. Boulton, M.Sc.Tech., F.R.I.C., F.T.I., president of the society, said that in the new edition of the "Colour Index," the dyes which had a diazonium group in their constitution, formed by far the biggest section of all groups, taking into account all chemical types of colouring matter.

Apart from the huge number of azoics (in which Griess's reaction was caused to take place on the fibre) there were very nearly 2,000 azo dyes sold commercially whose constitution was known. The number actually made by chemists in the last 100 years was probably of the order of 20 times that. Less than 30 years after Griess's original discovery, nearly 10,000 individual coloured azo compounds were covered by patents, most of them German.

"It is of course, because of this massive inheritance that we dyers and dyemakers claim Peter Griess for our own and why it falls to us to celebrate his work by the holding of this symposium.

Peter Griess, said Mr. Boulton, was one of the greatest chemists who ever lived. But there was a great deal more to Griess's work than this massive consideration of the dyes containing the chemical grouping which he discovered and discovered how to achieve synthetically.

"In the making of dyes of every class (including those in which there are no diazo groups at all) of drugs and pharmaceuticals, raw materials for the polymer industry, and the general gamut of organic chemics, it is necessary to make use of Peter Griess's discovery of the diazo reaction in order to produce intermediates although there may be no nitrogen at all in the final product.

"It should not be overlooked in our assessment of Peter Griess's discovery that the simple diazonium salt itself can be converted into a wide range of substituted aromatics to which, even now in a great many cases, his reaction is the only route. One cannot begin to count, or even determine the order of, the number of vital intermediates to which this has applied in the last 100 years and applies even now.

"All great discoveries have the indefinable flavour which comes either from utter simplicity or utter unexpectedness. What has to be remembered about the Griess reaction is that it has probably led to the synthesis of more new compounds than any other single reaction discovery in the realm of organic chemistry, yet it makes use of the most inert of all common chemicals—nitrogen. It is this circumstance more than any other that lights up Griess's discovery with the indescribable touch of genius."

Diazo Reaction in Dyeing

There were a number of main methods available for applying azoic dyes to cellulosic fibres, said Mr. H. R. Hadfield, M.Sc. and Mr. W. F. Liquorice (I.C.I. Ltd.) in their paper. Reviewing these methods, and their application to cellulose acetate rayon, Mr. Hadfield said they were: The classical method (discovered by R. Holliday) where the coupling component was first applied and the azoic dye developed by treating with a diazotised base and: Method 2, the inverse method (discovered by Green) where the base was applied, diazotised and the azoic dye developed by treating with a solution of the coupling component.

Method 3, the simultaneous method (discovered by Gurtler), generally known as the "naphthol-nitrite" process, where the base and coupling component were applied together and the azoic dye developed by treating with nitrous acid.

Method 4, the modified simultaneous method. This involved the application of a diazotate or triazine along with the alkali salt of the coupling component. On treatment with acid the diazotate or triazine gave the diazonium salt of the coupling component. On treatment with acid the diazotate or triazine gave the diazonium salt which combined with the coupling component to produce the azo dye.

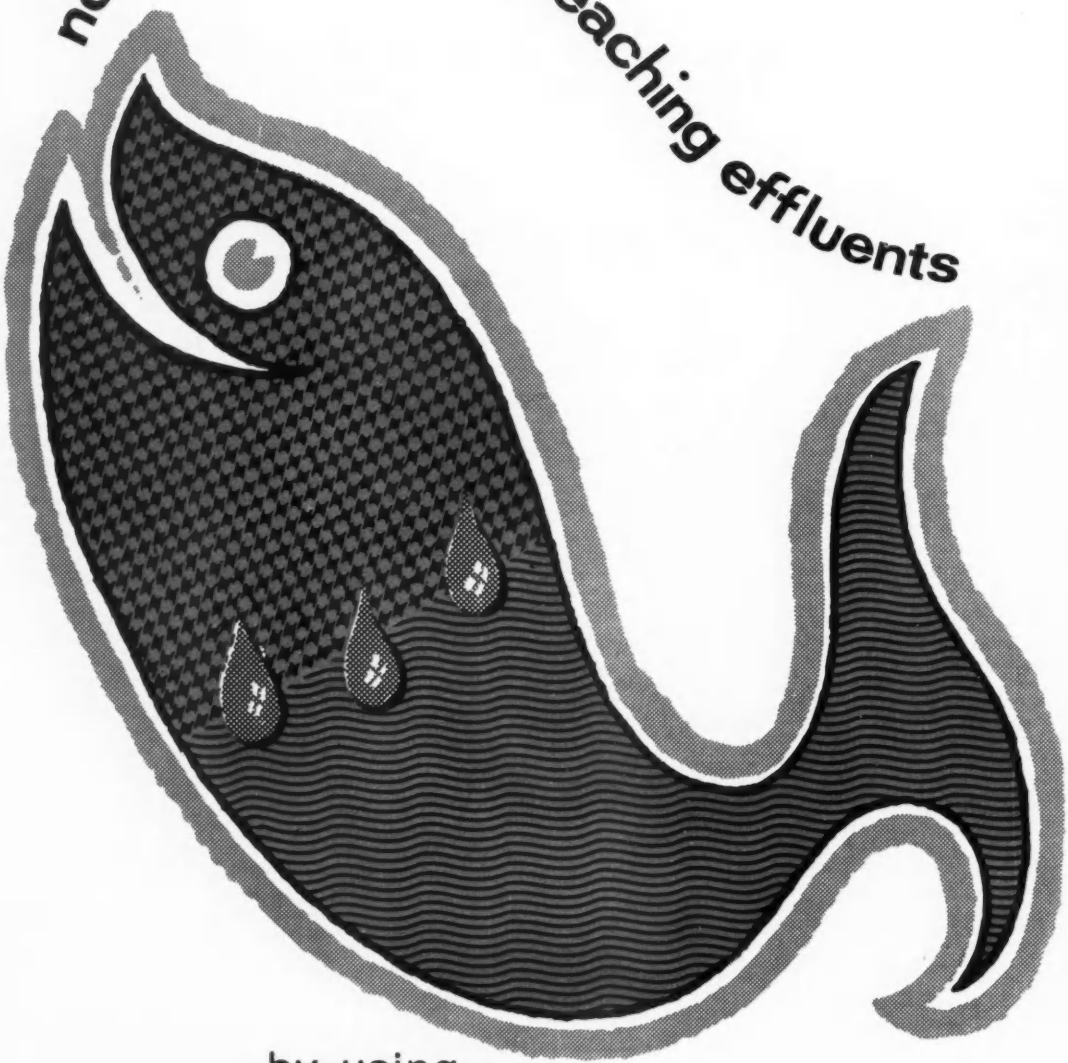
The inverse method was probably the most widely adopted for applying azoic dyes to acetate rayon. Attempts had been made, with some success, to use a method analogous to the Classical Method of applying azoic dyes to textiles. The simultaneous method of applying azoic dyes to acetate rayon was important and had recently assumed greater importance as it had wide applications for applying azoic dyes to triacetate, nylon and "Terylene." The modified simultaneous method had been utilised for dyeing cellulose acetate. It was interesting to record that, although the triazines were not developed for commercial use until the early 1930's, Peter Griess made a triazine from diazobensene and m-aminobenzoic acid in 1864.

Referring to application to nylon, azoic dyes had the desirable property of showing great coverage of irregular dyeing nylon and high wet fastness properties. Three methods were used for applying azoic combinations to nylon. The inverse method was first used for the production of black shades using Dispersol Diazo Black B (C.I. Disperse Black 1) and Dispersol Diazo Black 2BN (C.I. Disperse Black 2) with 2 : 3 hydroxynaphthoic acid as the coupling component. Diazotisation of the base was much more difficult on nylon than on acetate rayon.

The simultaneous method was more convenient for applying azoic dyes to nylon and greater reproducibility was achieved. The base and coupling component were applied from a highly alkaline

(l. to r.) Mr. John Boulton, M.Sc.Tech. (president of the Society of Dyers and Colourists); Dr. G. P. Warwick (Chester Beatty Research Institute); Mr. H. R. Hadfield, M.Sc.Tech. (I.C.I., Blackley) and Mr. C. Paine, B.Sc. (director, I.C.I. Ltd.)

no problem from bleaching effluents



by using

LAPORTE

HYDROGEN PEROXIDE

Advice on individual bleaching problems is available from LAPORTE Textile Technical Service Department.
TANKER OR CARBOY DELIVERIES

Laporte Chemicals Ltd., Luton · Telephone: Luton 4390 · Telegrams: Laporte, Luton

bath containing common salt and diazotisation and development was generally carried out simultaneously. The process was commenced cold and for acetate rayon, superior results were obtained with o-dianisidine if diazotisation is carried out separately and development subsequently achieved by treating in a hot buffered slightly alkaline bath. During the last few years the use of the simultaneous method has gradually been replacing the use of the inverse method, particularly for blacks, when applying azoic combinations to nylon.

"The textile properties of triacetate rayon result in the need for dyeings with greater wet fastness and heat fastness than are generally achieved on secondary acetate rayon," said Mr. Hadfield, in considering application to this fibre.

The simultaneous method was the most important method used for applying azoic dyes to triacetate rayon. At first 2 : 3 hydroxynaphthoic acid was used as the coupling component where it was found that in general, arylamides of 2 : 3 hydroxynaphthoic were not readily absorbed into the fibre. The use of 2 : 3 hydroxynaphthoic had drawbacks as this coupling component was not compatible with many bases used in dyeing.

Discussing application to "Terylene," Mr. Hadfield observed that azoic dyes were of great importance for dyeing "Terylene." In general, their use was restricted to the production of full red, maroon, navy and black colours but a brown was also possible.

"Terylene" was restricted to the simultaneous method). The first technique used was to employ 2 : 3 hydroxynaphthoic acid as the coupling component. Although 2 : 3 hydroxynaphthoic acid was compatible with many azoic bases it was not compatible with the bases employed for producing blacks and for this reason a time consuming technique was employed for the production of this important shade, where the base was applied first and the coupling component from a separate dyebath. Work on the high temperature dyeing of "Terylene" showed that at 120-130°C. arylamides of 2 : 3 hydroxynaphthoic acid were absorbed into "Terylene."

The effect of developing the azoic black over a range of temperatures and in open and sealed vessels had been investigated and in the case of the blue azoic dye the advantage of using a sealed vessel was immediately obvious; as might be expected the advantage was greater as the temperature of development is increased. As there was no possibility of loss of nitric oxide or nitrogen peroxide from a sealed development vessel it was probable that smaller quantities of sodium nitrite would be required to produce maximum development of shade. This possibility had been investigated and it would be seen from the results that not only were higher yields possible if development was carried out in sealed vessels but very large reductions in the quantity of sodium nitrite required was possible. For example, in the two cases examined, between 2 and 3% of sodium nitrite used in sealed vessels gave the same result as 6% of sodium nitrite used in open vessels. The use of reduced quantities of sodium nitrite in sealed vessels had been confirmed in bulk dyeings. It had also been found that, in the case of the black, if the quantities of sodium nitrite used were not reduced off-tone blacks were produced. It was thought that this effect may be due to some oxidation of the azoic pigment by the high concentrations of nitrogen oxides in the fibre, resulting from the high concentration of nitrous acid in the bath which was possible because of the pressure developed in the sealed vessel.

Some tests to compare the resistance of stainless steels had been carried out. The tests were carried out in an open vessel at 85°C. for 13 hours with sodium nitrite initially present in the liquor. The concentrations used corresponded to those used in developing azoic dyes on "Terylene." It would be seen that sulphuric acid did not affect the stainless steel to the same extent as hydrochloric acid. However, the steels usually used in dyeing machine construction were not seriously attacked even under the excessively severe conditions of the test.

"The application of azoic combinations to non-cellulosic hydrophobic fibres by printing has not met with any degree of success because of the slow rate of penetration of the components into the fibre," said Mr. Hadfield. "To obtain adequate penetration to ensure satisfactory fastness to rubbing and washing, steaming is necessary. The conventional method of printing azoic dyes on cellulose (method 1) consists of preparing the fabric with a coupling component and printing with a diazo compound. This technique is not possible on hydrophobic synthetic fibres since, after steaming, the coupling component cannot be removed from the unprinted portions. Furthermore the diazo compound when printed does not penetrate sufficiently without the application of heat and coupling takes place only in the outermost layer of the fibre which results in low colour yield and poor fastness. Steaming of the fabric after application of the diazo compounds is not possible since the diazonium salts are not sufficiently stable.

"An alternative method of printing azoic colours is that of printing a mixture of the coupling component in a caustic alkaline solution with a stabilised diazo compound, e.g. a diazoamino compound. This method is widely used for printing on cellulosic fibres but gives poor fixation on non-cellulosic synthetic fibres."

The Mechanism of the Diazotisation Reaction

THE diazotisation of amines in dilute aqueous acid appeared to proceed through the formation and rearrangement of a primary nitrosamine, as shown below.

$$ArNH_2 \xrightarrow[(1)]{} ArNH.NO \xrightarrow[(2)]{} ArN\text{-}NOH \xrightarrow[(3)]{} ArN_2+$$

The stages (2) and (3) were rapid, and the first step was usually rate-determining in the reaction. The formation of the primary nitrosamine from the amine could occur in several ways. One reaction path, particularly important in the diazotisation of amines in sulphuric and perchloric acids, involved the interaction of the amine with nitrous anhydride; this was formed from the nitrous acid by the reaction below.

$$2HNO_2 = N_2O_3 + H_2O$$

Under certain conditions this reaction was slow and rate-determining; the reaction rate was then independent of hydrochloric acid, an additional reaction path involving nitrosyl chloride was important, said Dr. J. M. Ridd (University College, London) when addressing the symposium.

(l. to r.) W. H. Cliffe, M.Sc. (I.C.I. Ltd., Blackley); Dr. C. J. W. Hooper (S.D.C.); Prof. W. Bradley (University of Leeds), and Dr. J. M. Ridd (University College, London)

A complete

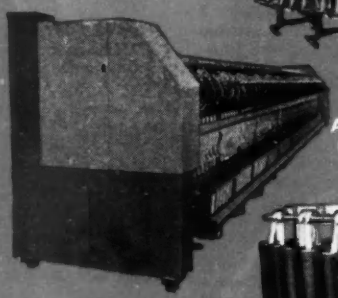
TUFTING YARN SYSTEM

for

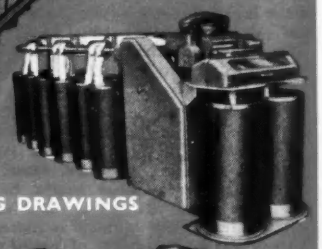
VISCOSE, ACETATE, HIGH CRIMPED NYLON, etc., 4-50 Deniers & 4"-8" Staple

AUTO DOFFING TAG END TWISTER

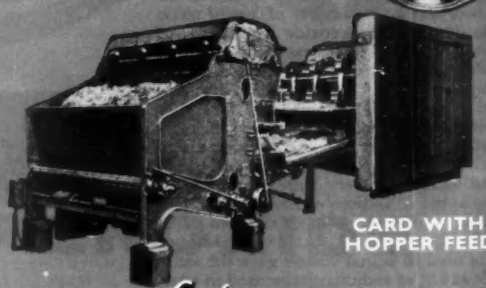
MACKROLL WINDER



AUTO DOFFING GILL SPINNER



INTERSECTING DRAWINGS



CARD WITH HOPPER FEED

- This Tufting Yarn System has been developed in response to the increasing demand for a non felting long-wearing carpet.
- The Gill Spinning Unit with its Pin Control and Automatic Doffing is the most versatile unit of its type on the market to-day.
- Gill spun yarns have been proven to give high tufting machine efficiencies.
- Complete Units sold to the United States of America, Europe, Africa and Australia.

ENQUIRIES INVITED SAMPLES SPUN ON REQUEST

TEXTILE MACHINISTS SINCE 1846

James Mackie & Sons Ltd

BELFAST, NORTHERN IRELAND

S2.

In strong acids (60% H_2SO_4 or 60% $HClO_4$), the nitrous acid was converted into ionised nitrosonium salts containing the ion $NO+$, and this then appeared to react with the amine. The nitrosonium ion was a more effective nitrosating agent than the species available in less acidic solutions. Much of the preparative value of strongly acidic media in the diazotisation of weakly basic amines came from the incidental formation of the nitrosonium ion; the greater solubility of the amine in the acidic media was also important. There was, however, no evidence that the protonated form of the amine was concerned in the reaction. The kinetics suggested that reaction always occurred through the free amine, even when it was only present in a minute concentration, concluded Dr. Ridd.

The Mechanism of the Coupling Process

ALTHOUGH a few hydroxyazo and aminoazo compounds were found at about the same time as Peter Griess discovered the diazotisation reaction, the first clear example of the coupling reaction was not described until a few years later. Appropriately Griess again was the discoverer and the particular example which he described was the union of diazobenzene nitrate and *a*-naphthylamine to form 4-phenylazo-1-naphthylamine, said Professor W. Bradley, D.Sc., Ph.D., F.R.I.C., F.S.D.C., (University of Leeds).

Important though this observation proved to be it caused no stir at the time. Even its extension to the union of diazotised amines with phenols did not occur until 1870 when Kekule and Hidegh found that diazobenzene chloride and phenol gave p-hydroxyazobenzene. When it was found that sulphonated components could be used and that the products were of value commercially, interest in the coupling reaction became intense. Several theoretical schemes were put forward to explain in the course of the coupling reaction but none of these had permanent value and it was not until 1920 that one could discern the seeds from which modern views had grown. On the contrary, on the practical side, important discoveries were made.

It was found first that the coupling reaction was applicable to a wide range of phenols and amines in the benzene and naphthalene series. Later it transpired that heterocyclic phenols, as methylphenylpyrazolone could be used, and even derivatives of acetoacetic acid. It became clear that the presence of an aromatic nucleus was not essential for coupling to take place, and K. H. Meyer showed in 1912 and 1919 that even hydroxyl and amino groups could be dispensed with when a sufficiently reactive diazotised amine was used.

Meyer's discovery that butadiene could be coupled to diazotised 2 : 4-dinitroaniline led to the idea that coupling was essentially the result of the attack of a diazotised amine on a carbon atom in the second component. Lapworth showed that the result was obtained because the second component was able to provide electrons to bind the diazonium ion. Robinson who worked closely with Lapworth in the study of the chemical reactivity of organic compounds published on several occasions pictorial representation of this aspect of the coupling process.

Robinson contributed also the idea that in the coupling of phenols and aromatic amines the hydroxyl and amino groups assisted the coupling reaction by allowing their own electrons to participate in the total reaction. Robinson's scheme enabled a simple explanation to be given of the occurrence of coupling even when the normal coupling position was occupied by a substituent such as carboxyl, the substituent being eliminated during the reaction. It also accounted for the demethylation of aryl methyl ethers which had been observed during coupling. Many unexpected effects had been observed in the coupling of phenols and amines and generally the explanation was that electrons were most readily available at the point where coupling occurs.

The part played by the diazotised amine had proved difficult to assess. This was the result of the equilibrium, diazonium ion diazohydroxide diazotate anion which could be demonstrated in aqueous solution. Recent work had shown clearly that the diazonium ion was the active component. For example, H. Zollinger had shown that the influence of increasing concentrations of potassium chloride on the coupling rate could only be explained in terms of the participation of diazonium ions. The same author had established that the displacement of hydrogen from an aromatic nucleus during coupling was a separate step by using C-salt have deuterium in place of hydrogen in the coupling position.

The lecturer finally referred to work carried out at the University of Leeds where J. D. Thompson had prepared a series of diazonium salts which were soluble in benzene. These coupled readily with B-naphthol and dimethylaniline but in addition to the expected azo-compounds which formed the main constituents of the products there were also produced simple benzene and diphenyl derivatives. The formation of these appeared to be due to the occurrence of radical reactions. The lecturer drew attention to the techniques used in forming azoic colouring matters on fibres. At the coupling stage the naphthol components were dry, and in view of the results obtained with benzene as solvent it would be unwise to assume that coupling on the fibre occurred in exactly the same way as coupling in aqueous solution.

Life and Times of Peter Griess

Mr. W. H. Cliffe, M.Sc., said Griess belonged to a vanished age. He was virtually an amateur scientist, in the sense that the work which brought him fame was completely unrelated to that upon which he relied for his bread and shelter. But Joule was a brewer and Nasmyth was an astronomer. "There is something about England and the English way of life which is oddly conducive to scientific amateurism. Why it should blossom more fully and bear richer fruit here than abroad is a matter for speculation," said Mr. Cliffe.

Mr. Cliffe traced the early life of Griess, from the day of his first lessons at the village school to Marburg University. In 1956 he took a position with the Cehler Tar Distillery at Offenback-am-Main, but an accident involving benzol and sulphuric acid reduced part of the factory to rubble some time later and Griess, being in modern parlance, redundant, returned to the University in the summer of 1857. But it was a different Griess from the happy-go-lucky student of former days. Separation from his student intimates, factory discipline, the chance to earn money, all these perhaps gave him a sense of purpose.

In the laboratory at Marburg he worked as he had never worked before. Proof against the enticements of his former companions, he was first in the laboratory, last to leave. What remained of his Offenback earnings, together with what his father could spare, cleared his debts but left him in such a state that when an accident with nitric acid damaged his trousers he could not afford to replace them. Griess was then 28 years old; a mature man with an uncertain future and a shallow purse.

"About the year 1848 Piria noticed that aminosuccinamic acid is transformable into malic acid by the action of nitrous acid. Six years later, Gerland, working at Marburg, and hence probably known personally to Griess, isolated hydroxy-

BICC CAPACITORS

are money savers!

Fitted to individually powered looms or spinning machinery BICC Capacitors cut electricity costs by improving the power factor. If a Power Factor Tariff is in operation they will quickly pay for themselves.

Compact and easily installed these small capacitors are specially suitable for use with textile mill machinery. Maintenance is negligible.

Why not investigate how BICC Capacitors can save *you* money?

Write today for Publication No. 251.

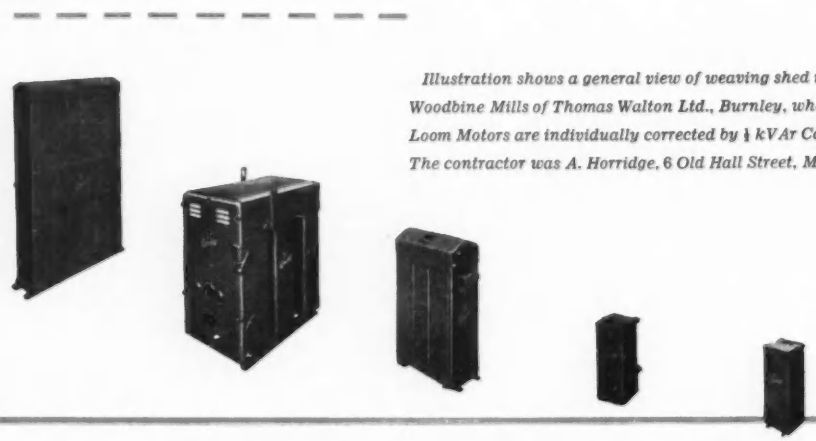


Illustration shows a general view of weaving shed in the Woodbine Mills of Thomas Walton Ltd., Burnley, where 192—½ H.P. Loom Motors are individually corrected by ½ kVAr Capacitors. The contractor was A. Horridge, 6 Old Hall Street, Middleton.

BRITISH INSULATED CALLENDER'S CABLES LIMITED, 21 Bloomsbury Street, London, W.C.1

benzoic acid as the product of reaction of aminobenzoic acid and nitrous acid. Not surprisingly, the reaction seemed to be complex. When Griess returned to Marburg from his first short-lived employment at Offenback, he turned his attention to reactions of this kind, very likely at Kolbe's suggestion. Sodium nitrite as a source of nitrous acid was unknown at the time. Some years had still to elapse before Martius's discovery of this great boon to the dye chemist.

Griess's methods were cumbersome. He generated nitrous fumes by reducing nitric acid with starch or arsenic trioxide. By what strange trick of fate did he choose picramaic acid as his starting material? He needed ethanol to dissolve it. Ethanol and nitrous fumes gives ethyl nitrite, and ethyl nitrite and picramic acid gave a mass of crystals. Those crystals were a modern philosopher's stone. There was magic in their touch. They masquerade today under the prosaic name of 4 : 6—dinitrobenzene-2 : 1-diazo oxide, but the magic is still there. This then, was the first of an entirely new class of chemical compound, the diazo compounds."

Mr. C. Paine, B.Sc., F.R.I.C., F.S.D.C., in closing the conference, said they had been honouring the name and memory of Peter Griess. "It is certainly not because he was some great flamboyant personality who could not at any stage of chemical history be overlooked. It is not, I venture to suggest, merely or primarily because of his scientific work, solid and sound though that was, involving as it did the handling of difficult unstable compounds at a time when the knowledge of systematic structure was limited and often faulty. It is noteworthy that the volume of Liebig's "Annalen" which contained Griess's first paper contained also an early paper by Kekulé which made clear the quadrivalent nature of carbon. "Our interest in the man and his work stems, I think from our realisation looking in retrospect over a hundred years that the repercussions from Griess's work, particularly in the fields of technology, have been so impressive. It is to this aspect that our symposium has done perhaps rather less than justice. We have not so far reminded ourselves of the part which azo dyestuffs played in the early anti-bacterial work or that the modern sulphonamides began with Prontosil Rubrum, an azo dyestuff of which Peter Griess can be considered the grandfather.

"The influence of Griess's work on the development of dyestuffs technology can of course hardly be over-estimated. The diazotization and coupling reactions afford a relatively simple means of building colour units with systematic variations in structure which has proved quite invaluable to the dyestuffs chemist. By systematic and sometimes tedious examination of the various permutations and combinations possible by this technique there has been amassed a considerable amount of knowledge of the broad relationships between dyestuffs research worker principles by which to forecast overall properties. More important, it has enabled him to devise an appropriate compromise of properties of the fulfilment of a particular technological purpose. For example, by proper choice of the number and disposition of sulphonic acid groups and other structural features it is possible to arrive at a compromise balance in affinity for cotton and wool which has value in the dyeing of mixed fabrics. Similarly it is possible to design azo dyestuffs with comparable rates of dyeing so that the dyeing of mixtures can be more effectively controlled. The same tools enabled the problem of dyeing cellulose acetate to be solved and principles of affinity for this and other new fibres to be elucidated."

(l. to r.) Mr. J. R. Reidy, M.A.(Com.) (Chairman, Manchester Section, S.D.C.); Prof. H. R. Peters (Manchester College of Science and Technology), and Mr. K. Meldrum (hon. secretary, Manchester Section, S.D.C.)

Griess himself had little or no flair for technology and the industrial significance of his work is entirely due to other contemporary pioneers. Certainly Griess's original technique of diazotisation left unchanged would never have been a serious industrial large-scale technique. We take for granted the simple and elegant technique of diazotising a base in an acid aqueous medium using sodium nitrite solutions. Curiously enough the originator of this simple device, as far as I can determine, remains in confused obscurity.

"You may feel that I am worrying about biographical trivia but I believe there are two important morals in the situation. The first is that in the documentation of our scientific and technological progress we all too often overlook the role of technologist in converting the exotic techniques of the laboratory into a useful industrial operation. The second is a reminder to the young chemist just starting his career in industry that in industry pure science however good is not enough unless illuminated by that practical imagination capable of scaling up a laboratory reaction with simplification and elegance.

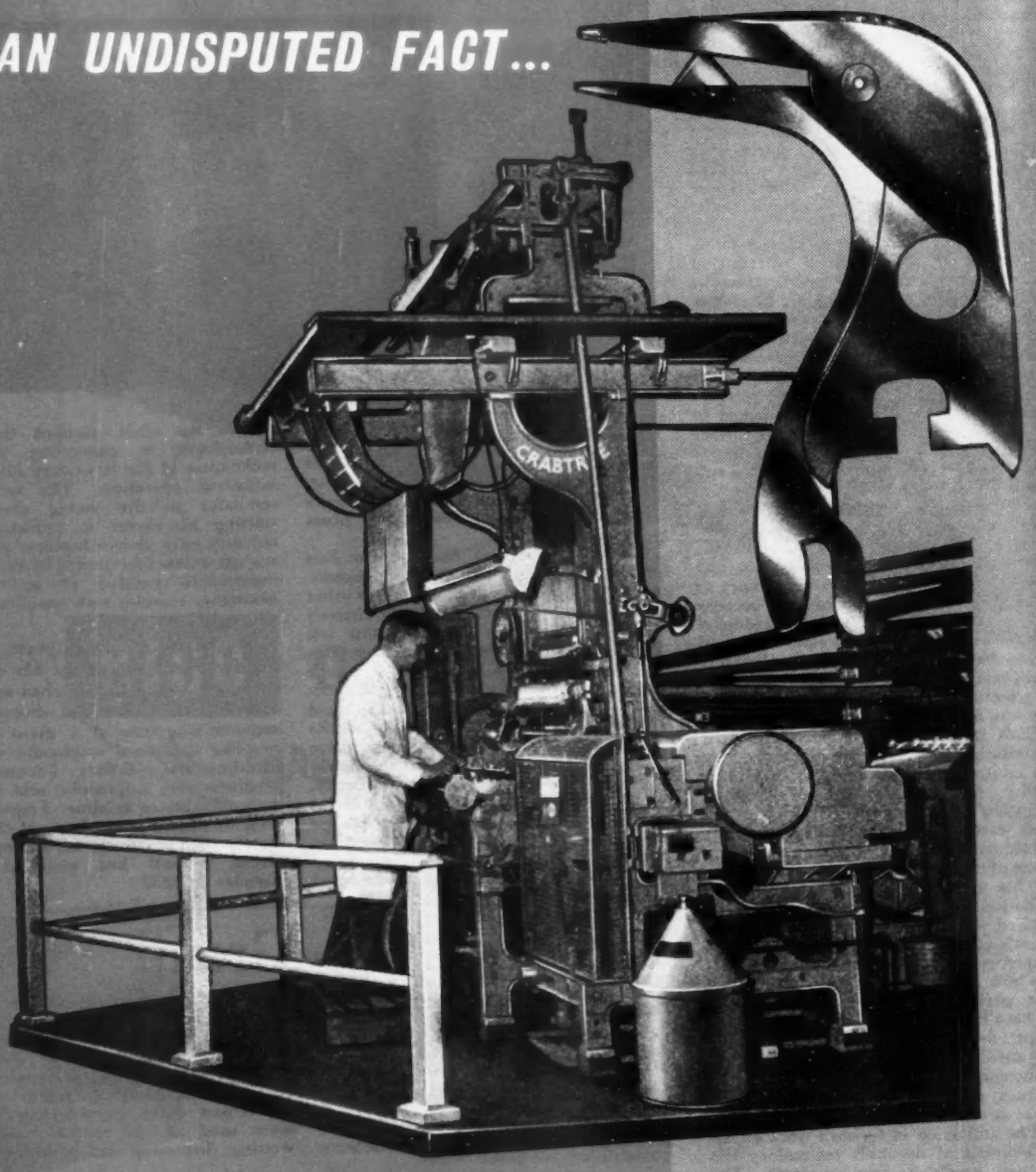
"But to return to Peter Griess, the prime cause of our Symposium. My own mind goes back to the 1920's when as a young chemist I thought I had discovered the apparent migration of a diazo group in coupling diazotised sulphanilic acid with toluidines and xylidines. I found the end products were sulphanilic acid itself and diazo toluidine or xylidine. I remember my disappointment when I found that I had merely rediscovered something which Griess himself had recorded in the Berichte in 1882.

S.C.I. Group

At the inaugural meeting in Manchester of the newly-formed Paper and Textile Chemicals Group of the Society of Chemical Industry, over 100 members attended and the address was given by Mr. R. C. Tarring (manager, Detergents Department, Shell Chemical Co. Ltd.) whose subject was "Petroleum Chemicals for Textiles and Paper." On petroleum chemicals as processing aids, he said the first major production of synthetic detergents in this country was planned and undertaken originally with the textile industry in mind as the major outlet. Although the household market was now the largest outlet, considerable tonnages were used in the textile industry for wetting, dispersing and detergency.

A photograph taken at the inaugural meeting of the newly formed Paper and Textile Chemicals Group of the Society of Chemical Industry. (l. to r.) Dr. F. Liversedge (hon. secretary and treasurer); Mr. R. C. Tarring (Shell Chemical Co. Ltd.); Dr. A. K. Mills (vice-president, Society of Chemical Industry); Col. F. Griffin (general secretary, Society of Chemical Industry); Mr. J. Boulton (president, Society of Dyers and Colourists); Dr. H. A. Thomas (chairman, Paper and Textile Chemicals Group of S.C.I.)

IT'S AN UNDISPUTED FACT...



the finest loom produces the finest carpet with the greatest economy.
Crabtree Gripper and Spool Gripper Looms have that smoothness and efficiency which only years of experience, experiment and skill can build into a machine.
Capacity of Looms range from 18" to 4 yd. and from 50 cm. to 350 cm.
If you are extending or modernising your plant, consult Crabtree.
Our technicians are at your service.

crabtree
WORLD FAMOUS GRIPPER LOOMS

DAVID CRABTREE & SON LTD., BRADFORD. Telephone 64252/3

Book Reviews

INVESTMENT IN INNOVATION. By C. F. Carter and B. R. Williams. Oxford University Press, Amen House, Warwick Square, London, E.C.4 (price 15s.).

During the course of investigations leading to the publication of their book "Industry and Technical Progress," the authors received a suggestion from the Board of Trade that a subsidiary report be prepared on the background of investment decisions. "Industry and Technical Progress" was concerned with influences on the rate of adoption by British industry of new scientific and technical ideas and the authors' evidence was derived from 250 case studies covering large, medium and small undertakings in the principal industries. Their second book makes use of material thus obtained. Both works are published for the Science and Industry Committee. The term "investment," as here used, refers to expenditure on plant, machinery, vehicles and buildings and the authors' object has been to find out how and why such capital investment decisions have been made in the case of new methods and products. The study of investment in innovation is worthwhile because it is "a component in the circuit which links the pure scientist in his laboratory with the consumer seeking a better satisfaction of his needs." The report's findings make most interesting reading, particularly the authors' distinction between "active" innovation, brought about by deliberate searching for new markets and techniques with or without direct market pressure, and "passive" innovation in response to direct market pressure in such forms as developing competition, falling profit margins or excess demand. Several analytical tables are included.

S.P.S.

* * *

THE STRUCTURE OF BRITISH INDUSTRY. A symposium edited by Duncan Burn. Vol. 2. Cambridge University Press, Bentley House, 200 Euston Road, London, N.W.1 (price 50s.).

Professor Walter Adams edited a symposium on American industry ("The Structure of American Industry," 1950; also a revised edition 1954) which was designed to present a representative view of U.S. industry for the use not only of the professional economist but also of the intelligent layman, using the "case study" or "individual history" approach. The support of Conditional Aid was later secured to undertake a similar survey of British industry and the National Institute of Economic and Social Research assumed responsibility for the venture. The original intention was that all the contributors should be economists already authorities on particular industries but, for various reasons, the plan was widened so that economists were asked to write on industries which they had hitherto not examined in detail. Their task was to give an up-to-date picture of a group of British industries—the number, size, scope and inter-relations of the firms or units within each industry, relations with the government and with overseas industries—and to study the effect of the industrial structure on economic performance, adaptability to markets and to technical change, emphasising the more significant factors. Volume 1 dealt with industries providing basic raw materials, and the volume under review covers those producing more highly finished products largely for consumption. Between them, the two volumes cover industries accounting for 40% of the net income of all manufactures and considerably over 40% of the total industrial employment. The contributors to Vol. 2 are Aubrey Silberston (motor industry); Professor Ely Devons (aircraft manufacture); Professor A. K. Cairncross and J. R. Parkinson (shipbuilding); Thomas Wilson (electronics); G. W. Furness (cotton and rayon); G. F. Rainnie (woollen and worsted industry); Professor D. C. Hague (man-made fibres industry); Professor B. R. Williams (pottery industry); C. J. Thomas (pharmaceuticals); and H. Townsend (cutlery). The authors' methods of approach and arrangement of material differ considerably, as indeed they must by reason of the varied traditions and characteristics of the industries examined, but a common purpose is discernable throughout and differences of treatment make for more interesting reading.

Statistical tables are included in most chapters and bibliographies are added to each chapter to draw attention to relevant official and other publications. The editor's 64-page "Retrospect," with which the volume ends, is a masterly assessment of the present situation of British industry. Mr. Burn emphasises the contrast between its economic environment during the inter-war years and since the war, and discusses the standards and criteria, such as price, profit and productivity statistics, used to relate performance to structure. He further examines the contributors' comments on competition and efficiency. A fourth section sums up and supplements what has been said about the finance of investment, the new institutions and the changes in relative importance of various sources of finance, and the effects of taxation on structure. Section 5 studies the impact of the State, as owner, supervisor, buyer or subsidiser, on the use of resources.

* * *

DIRECTORY OF OPPORTUNITIES FOR QUALIFIED MEN, 1959. Cornmarket Press Ltd., 1 Lower James Street, London, W.1 (Price 8s. 6d.).

Those who have obtained professional or technical qualifications and yet need reliable guidance on the use of their talents will find just what they need here. The reference section contains a wide selection of entries from companies and organisations in which they describe themselves, their work and the openings to qualified men and women. It also contains a classified index which lists their activities and a map showing locations referred to in the classified index. A further index links up different types of qualified personnel required with the companies recruiting them. The preface by Sir Miles Thomas and the articles in the editorial section are most helpful reading for those seeking suitable employment. For qualified people wishing to keep up-to-date there is a list of short full-time courses scheduled for 1959.

S.P.S.

* * *

BIG MOLECULES. Sir Harry Melville, K.C.B., Ph.D., D.Sc., F.R.S. G. Bell and Sons Ltd., York House, Portugal Street, London, W.C.2 (price 15s.).

Based on a recent series of Royal Institution Christmas lectures the author deals—in 180 pages—with a fascinating subject in the most efficient manner by making it interesting and holding the reader entranced throughout the book. To simplify an involved subject of this nature is no mean accomplishment. The author describes the nature of big molecules—natural and man-made—and shows how the knowledge of their structure has enabled chemists to design and make molecules for specific purposes. Much of the book has a distinct textile significance for in Chapter 3 the molecular structure of man-made fibres is dealt with in a lucid, well-illustrated style easily grasped by people with no textile knowledge or experience. Most of this section is concerned with nylon—its constituents, production, physical and chemical properties, and crystallisation phenomena. An earlier chapter discusses the role of big molecules in everyday life, the making of big molecules and the behaviour of the carbon atom. In explaining the chemistry of making big molecules Sir Harry describes several of the better known reactions such as the production of Perspex, synthetic rubber, etc., Chapter 2 is concerned with some of the methods of size determination, each having its own specific sphere of application. Chapters 4 and 5 are concerned with rubbers and plastics respectively in both of which tremendous developments have occurred during the last twenty years. In the last chapter the chemistry of polymers is dealt with in the same easy style as the preceding sections. Although intended mainly for older boys and girls specialising in science and to young people about to enter industrial chemistry, the book will undoubtedly be read in circles far outside these two because of its attractive presentation.

J.O.E.

* * *

NICKEL BULLETIN. Mond Nickel Co. Ltd., Thames House, Millbank, London, S.W.1. A feature of the Sept./Oct. issue is the quarterly review of recent patents. This section contains abstracts of over fifty patents which illustrate the importance nickel is assuming in almost every branch of industry. In addition, the bulletin contains the usual review of literature relating to nickel. Current interest in high-temperature alloys is reflected in, *inter alia*, an item referring to a new alloy in the "Nimonic" series, and in others concerned with creep, thermal-shock and stress-rupture properties. The nickel section of the issue contains items on extraction and determination of the metal, while that dealing with electrodeposition includes references to papers on residual stress and the effect of nickel undercoatings on the oxidation-resistance of enamelled steel.

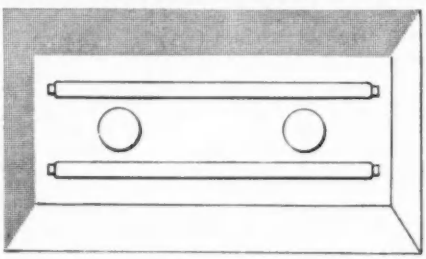
correct light for colour matching—£25

For matching dyes, fabrics, pigments or products of any kind where colour enters into the specification, you need a special type of light. But it needn't cost you a lot of money. The Siemens Ediswan Industrial Colour Matching Unit gives you an unvarying source of artificial daylight of high luminous intensity for only £25. The spectral quality of the light from this unit is almost identical with that of natural daylight at a colour temperature of 6500—7000°K. The shaped reflector and 24 x 17½ in. diffusing screen spread the light evenly over the working area and there is a remote control that switches off the fluorescent tubes for matching colours by incandescent light only. The unit is supplied ready to operate directly from the 200/250 volt 50 cycle supply. Total consumption is 220 watts. We will gladly send you a folder describing in detail the unit and its method of use.

INDUSTRIAL COLOUR MATCHING UNIT TYPE FTF 2444

SIEMENS EDISWAN

SIEMENS EDISON SWAN LIMITED
LAMP & LIGHTING DIVISION,
38/39 UPPER THAMES STREET, E.C.4.
DISTRICT OFFICES AND BRANCHES
THROUGHOUT THE COUNTRY.



Complete with control gear, lamps (2 filament and 2 blue fluorescent), remote control box and 2 yd. 7 core cable.

PRICE: £25

This price includes Purchase Tax on lamps

CRC PD 11

NEW CHEMISTRY. A New Scientific American book. G. Bell and Sons Ltd., York House, Portugal Street, London, W.C.2 (price 13s. 6d.).

In step with every other branch of science, chemistry continues to advance at a steadily increasing pace, and no single work could ever hope to embrace the whole field of development. Divided into four main sections, the chapters of this excellent new book originally appeared as articles in *Scientific American* and they report in a precise, non-technical manner some of the advances considered among the most significant in recent years. "Hot Atom Chemistry," "High Speed Chemistry," "High Temperature Chemistry" and "Free Radicals" are the articles in the first section. Section 2 comprises "Ultramicrochemistry," "Chemical Analysis by Infra-red," "Chelation" and "Ion Exchange"—all written in the most lucid manner by acknowledged experts in these spheres. Section 3 is concerned with new elements—again in four articles: "The Rare Earths," "Synthetic Elements" (1 and 2), and "Studies in Corrosion," the last being of major importance in the construction and operation of nuclear reactors. The concluding section, devoted to new compounds includes articles on "Silicones," "Fluorcarbons," "Rubber" and "Synthetic Detergents," in which the last could, with advantage, have been expanded. It is interesting to note that approximately 2·3 billion lbs. of these new cleansing substances were consumed in 1955 in the U.S., compared with 1·4 billion lbs. of solid soap in the same period. At the modest price, this valuable little book of 200 pages should be read by all science students to broaden the outlook.

J.O.E.

* * *

BRADFORD TEXTILE SOCIETY JOURNAL. 9 Market Street, Bradford 1 (price 10s.).

Maintaining its usual high reputation for quality and interest, the 1957 - 58 edition contains a detailed record of the Society's activities including technical and other lectures, social events, prize schemes, etc., and visits. Beautifully printed and superbly illustrated, it is a worthwhile addition to every library—private or public.

A.D.

* * *

MODERN CARPET MANUFACTURE. By A. Crossland. Columbine Press, Old Colony House, South King Street, Manchester 2 (price 21s.).

This text book covers in detail the diversity of processes involved in modern carpet manufacture. It is designed to deal with the whole field of carpet manufacture from the raw material to the finished carpet. The preliminary chapters on carpet yarns, dyeing, preparatory processes, on design, colour and fabric construction are followed by a description of the main carpet manufacturing processes, with the final section on non-woven carpets, with particular reference to tufted carpets. The author is a technical authority on the subject; his book is well written and very instructive. The bibliography at the end is rather scanty however and the names of the publishers and year of publication should be added to the eight books listed. It is a well printed work with 78 illustrations and a number of well produced plates. Filling a gap in the literature on the subject, it deserves to be well read.

B.S.

DECORATIVE ART, 1958 - 1959. Edited by Rathbone Holme and Kathleen Frost. The Studio Ltd., Hulton House, Fleet Street, London, E.C.4 (price 35s.).

The editors' introductions to successive issues of this Studio year book have always provided informed reviews of contemporary trends in interior decoration and commentaries on the pictorial examples which form the bulk of each volume. This latest edition contains an introductory summary of current international design problems, techniques and reorientations which takes into account new materials available, the modern demand for flexibility and the reconciliation of spatial demands with shrinking volumes. Sixteen of the five hundred and sixty illustrations which follow are in colour. The first section of the volume depicts houses and apartments in Britain and overseas which are remarkable for originality of design. Outstanding designs in furniture, table ware, furnishing and curtain textiles, glass and ceramic wares and light fittings are shown in the six sections following. Each illustration is accompanied by a brief annotation and an index to architects, designers, artists, craftsmen and manufacturers is a particularly useful feature.

S.P.S.

* * *

MARKETING IN CANADA. Edited by Edward J. Fox and David S. R. Leighton. Published by Richard D. Irwin Inc., Homewood, Ill., U.S.A. 1958. Pp. 437 ($ 6.50).

The publication of this book was sponsored by the National Office of the American Marketing Association. It covers the problems of marketing in Canada and provides a valuable source of information on many aspects of the Canadian market. It should be of profound interest for any person or firm considering the Canadian market for their goods. Some 39 authors from academic life, commerce and industry, and from government service contribute and survey practically every aspect of Canadian life and marketing possibilities. The first chapter has articles on the Canadian market, the Canadian consumer, the economic growth of Canada and the future of the Canadian market. Other chapters deal with the regional markets, the distribution channels in Canada, auxiliary marketing services, such as advertising, banking facilities, with regulations affecting marketing, trade marks, design, sales forecasting by manufacturers and retailers. Selected case histories are given in the last chapter. Sources of Canadian marketing information are listed in the appendix, with names and addresses of federal and provincial Government offices, trade associations, trade and industrial publications, and relates matters. It is a very informative guide and reference book.

B.S.

* * *

CELLULOSICS. By W. D. Paist. Chapman and Hall Ltd., 37 Essex Street, London, W.C.2 (price 46s.).

This 270-page book is the fifth in the Reinhold Plastics Applications Series, each volume of which is semi-technically written so as to cater for designers, manufacturers, industrial users of plastic materials and even the "Do-it-yourself" layman. Dr. Paist supports his claim that the cellulosics have a greater variety of uses than any other polymer by outlining a really formidable number of applications, many of them so little known that reading about them may well stimulate enterprising manufacturers to extend their range of products. Three short chapters serve to acquaint the reader with the cellulosic family's background, chemistry and properties and the remainder of the book is occupied by descriptions of fabrication methods and the applications of cellulosics in many fields, including fibres, fabrics and protective coatings. A final chapter indicates new developments. The book is an excellent guide to the choice of the most suitable material for a given product or purpose.

Trade Literature

FIRE PROTECTION ASSOCIATION, 15 Queen Street, London, E.C.4. The Association's latest Bulletin discusses the problem of large businesses which "put all their eggs in one basket." It gives details and photographs of several serious fires in factories, warehouses and department stores, and outlines the ideal fire protection measures which should be considered for large business concerns. The Bulletin stresses the fact that even if full compartmentation is not possible especially hazardous areas such as paint shops, flammable liquid stores, packing departments, magnesium working sections, heat treatment sections, and canteens, should be separated from the main working area.

* * *

COVENTRY CONVEYOR CHAIN. Renold Chains Ltd., Renold House, Wythenshawe, Manchester, have released a leaflet describing the slat band chain, a revolutionary conveyancing medium of great strength and simplicity incorporating high standards of accuracy and finish which ensure continuous, smooth operation over prolonged periods. The chain itself consists of two components, the slat and the pin. The pin is a force fit in the outer barrels of the slat and a running fit in the inner barrel of the adjacent slat. The wheel teeth engage the gearing barrels at their points of articulation. Chain is supplied in stainless material or case-hardened mild steel.

* * *

INDUSTRIAL CLIPPING. Wolseley Engineering Ltd., Electric Avenue, Witton, Birmingham 6, have released an eight-page illustrated brochure describing some of the uses to which industry has put their sheep-shearing and annual clipping machines. A photograph is included showing an operator making 3-in. gaps at intervals in a roll of carpet. This gap is cut halfway across and the resulting 1½ ins. each side is turned in and stitched for mats.

Induction Heating-1

Electro-magnetic induction was discovered by Faraday and used by him to evolve the electric motor. In some cases, induction can be a nuisance by causing heat losses to arise from induced eddy currents in nearby pieces of metal, but in industry today those heat losses are being turned to good account as a method of metal heating.

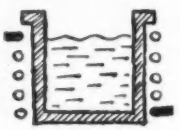
Induction heating produces heat only in the work piece. This is a fascinating and spectacular process which has the additional merit of being extremely effective. An important feature of induction heating is that it gives rapid temperature rise with no time lag, starting being instantaneous. Perhaps its greatest advantages are that it can be used in automatic processes and does not demand skilled labour.

Induction heating can deal efficiently with all the applications outlined below, and including metal melting, preheating and stress relieving, surface hardening, heating of large components, preheating of steel tubes for manipulating, heating for shrinking, for forging and extrusion, as well as for the heating of vessels. There are various methods of applying it, the method to be used being dictated by the application.

Technical details relating to the choice and use of individual types of induction heating will be set out in a subsequent data sheet.

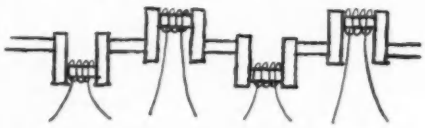
Metal melting

The oldest and largest application of induction heating lies in the melting of metals. The outstanding advantages are: freedom from deleterious gases and products of combustion and other contaminants, rapid speed of melting, low running costs, improved working conditions and reduced metal loss.



Metallurgical processes

This covers a large variety of processes which may be basically divided into surface heating and through heating. Most processes fall into the former category and are used for the purpose of



skin hardening. They include the treatment of such components as: pins, camshafts, crankshafts, rollers, cylinder liners, gear teeth, rocker arms and shafts and valve stems.

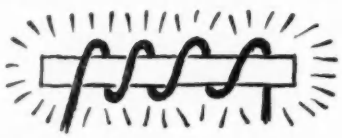
5857

Through Heating

When the current in an induction coil is maintained for a longer period it results in the heat engendered in the work piece penetrating to a greater depth and eventually throughout the piece. It is largely used for the heating of slugs and billets, for upsetting and upset forging, flanging and nosing, shearing and forging and bolt blanks for heading.

Annealing

Induction heating is the ideal method of altering the character of metals for a special purpose. Annealing and its related process of tempering, normalising and stress relieving are prominent in



this category. In the case of annealing, one feature of the treatment is that it can be localised, while induction tempering can do in one minute what would require half-an-hour or more with conventional furnace heating.

Brazing, soldering and welding

Brazing and soldering by induction are the quickest and cleanest methods of joining metals together, and it is often beneficial to re-design the parts so that the fullest advantage can be taken of induction heating. Brazing can be used in the case of: carbide inserts for tools, tips for rock drills, parts for universal joints, etc., while the many applications of soldering are well-known. It was not until well into the present century that the age-old craft of welding became a positive aid to greater productivity. Induction welding produces a good, clean weld because oxidation is almost absent.

Miscellaneous Application

Induction heating can be profitably used for a large variety of purposes, including the fusion and hot pressing of powders, heating *in vacuo*, gas determination in metals, fusion of glass, chemical work and many other processes.

For further information, get in touch with your Electricity Board or write direct to the Electrical Development Association.

Excellent reference books are available on electricity and productivity (8/6 each or 9/- post free)—"Induction and Dielectric Heating" is an example.

E.D.A. also have available on free loan a series of films on the industrial use of electricity. Ask for a catalogue.

Issued by the Electrical Development Association, 2 Savoy Hill, London, W.C.2.

Textile Trade and Prospects

Cotton Yarn and Cloth Markets

Conditions in cotton spinning and manufacturing circles continue in much the same way with few improvements in any direction. Apart from the poor business atmosphere, the long drawn-out delays in the negotiations with Hong Kong, coupled to the enquiry into the spinners' price agreements, creates uncertainties and undermines confidence. Order books in most cases are in very bad shape, and stoppages and short-time working show no sign of lessening. Even a reduction of from 2d. to 5d. per lb. in prices of some yarns from Sudan cotton made little difference to those spinners producing them; the manufacturers response shows just how cautious is the outlook at present. The volume of business going through at the moment is probably just keeping level with the reduced output. Inquiries for yarns have covered almost every type of count and quality but orders fixed have been small. The tendency for some manufacturers to place orders and then take less of the weekly deliveries does nothing to improve matters. Yarn spun and stored is idle capital and the product itself does not go better with standing. Standard weaving qualities on ring beam, cheese and cone have formed the largest part of the business actually finalised. Medium and coarse numbers have been fairly well supported but spinners of combed Bolton-type yarns are not finding the market at all helpful. Condenser yarns are in good request and blended specialities, and some of the doubled, cabled and novelty effect yarns are in good demand.

In cloth production the same hand-to-mouth buying continues. At this time of the year replacement buying is usually keeping the looms occupied but the present off-take in trade is slow and uncertain. Follow-on orders are slow to materialise. New business is scrappy and in some lines non-existent. Sales in small volume have covered a wide range of dress goods in cotton, rayon, etc., in dobby, jacquard and printed designs. In some, the margins have been very fine but manufacturers do not hesitate rather than stop more looms. "Invented" complaints and returns are still a nightmare in the trade and the slightest excuse put forward to cover some cancellations. Furnishings have been in rather better demand but here again, the orders booked do little if anything to help re-start idle looms. Tone and tone colour values are more in favour at the moment than strong contrasts. Cotton and spun rayons have accounted for most of the available business and the greatest proportion for the home market. Demand for household textiles has slackened appreciably, particularly in quilts and sheetings, etc., but a new type of quilt suggestive of terry weaving is attracting some interest at present. Woven grey and piece-dyed results in a very novel bed-cover. Towels in an ever-widening range of dobby and jacquard designs in bright colours, pastel shades and use of metallic yarns reveal a lively imaginative outlook that achieves its object in stimulating sales in a resistant market. Interest in industrial cloths has been keener than of late but even in these specialities much more business would be welcomed. Export markets are inactive at present although one or two outlets have absorbed modest quantities of dress and furnishing cloths.

Wool Production and Consumption

U.K. exports of wool tops for ten months of 1958 totalled 73·3 million lbs., compared with 70·8 million lbs. in the corresponding period of last year, according to B.o.T. Trade and Navigation Accounts. Wool top exports from the U.K. last year set up a post-war record of 83·2 million lbs. and, if the recent rate of shipment can be maintained to the year-end, British exporters are hopeful they will be able to exceed last year's record. The largest overseas customer for U.K. tops is China which, so far this year, has taken 13·6 million lbs., or 50% more than during the whole of 1957. India and Canada are second and third largest buyers. Imports of raw wool into the U.K. during October were 52·8 million lbs. (actual), compared with 51·5 million lbs. in October last year. For ten months of 1958, wool imports into the U.K. were 510·6 million lbs., compared with 581·6 million lbs. in the corresponding period of 1957, and 570·9 million lbs. in ten months of 1956. Imports from Australia and New Zealand were somewhat smaller this year than last year, but imports from South Africa showed an increase of 3 million lbs.

During September, according to figures issued by the Wool Industry Bureau of Statistics, U.K. wool consumption and top production were about the same as in June, while worsted yarn deliveries were somewhat higher. At the same time, all were about 7 to 11% lower than a year ago. An encouraging feature of the returns is that the number of operatives employed during September showed an increase of 439 compared with August, the first increase for some months. Output figures for September were: wool consumption, 38·88 million lbs. (clean); top production, 25·64 million lbs.; tops drawn, 16·40 million lbs.; worsted yarns delivered, 17·90 million lbs.; woven wool fabrics delivered, 30·52 million sq. yds.; blankets delivered, 3·25 million sq. yds.

About 46,000 bales were expected to be available for the London wool sales to take place during the fortnight beginning November 24. The total was made up as follows: *Australian*—9,500 bales, comprising 8,500 greasy and 1,000 scoured; *New Zealand*—28,000 bales, comprising 9,000 greasy, 5,000 scoured and 14,000 slips; *South African*—2,100 bales, comprising 2,000 greasy and 100 scoured; *Kenya*—400 bales of greasy, and *English*—6,400 bales. Commonwealth wool was sold on Wednesday and Friday of each of the two weeks, and there was a separate sale of British wool on December 4.

Linen Trade Review

The anticipated buying expansion normally experienced during autumn when merchants and retailers cover for Christmas did not materialise to the extent hoped for, nor has normal replacement coverage been effected on the usual scale. Manufacturers have consequently had no relief from the problem of maintaining output at an economic level. As usual, a certain amount of weak selling has tended to depress prices without stimulating demand. It would seem that a further stage has been reached in relation to demand at which the volume of business booked during the recognised "active" periods is insufficient to enable many firms to weather the economic strains of the intervening months, and that further contraction of productive capacity is inevitable. In an effort to stimulate demand the N. Ireland section of the industry, through the Irish Linen Guild, has appointed Mr. A. B. M. Taylor whole time director of publicity.

Until recently firms specialising in the manufacture of linen threads, fishing lines, nets, etc., enjoyed a virtual monopoly of an important section of the market for these products. Steps taken in recent years by former customer countries to develop domestic production, together with the increasing competition of man-made fibre manufactures in these spheres, have reduced the demand for British products, and for many purposes the newer man-made fibre products are proving more economic when assessed on serviceability and end use performance. While many linen thread manufacturing concerns have been prompt to recognise the merits of these new fibres for specific purposes, and have included them in their range of products, the urgent need to make the latter more competitive on a price basis is recognised by steps now being taken by group concerns to effect a greater measure of integration in order to streamline production and reduce manufacturing costs.

Spinners are concerned over the problem of raw material supplies. Re-entry of the U.S.S.R. into the market as an exporter has solved the problem so far as low and medium grade material is concerned, and so long as this source remains open the loss of home grown flax will not be keenly felt. It is the shortage of high grade fibre, obtainable only in West European markets, that is the main cause for concern

B·O·A·C introduces the Shippers' Service Unit

...a new, unique aid to air cargo users!

BOAC's Shippers' Service Unit offers you something entirely new in air cargo service. Now, from any point in the U.K., your telephone becomes a direct link with BOAC's unique team of freight experts—*and the whole procedure is streamlined.*

For instant action on any consignment 'phone BOAC (VICtoria 2323) and ask for "SKYLOAD". You will go straight through to the Shippers Service Unit, for immediate information on costs, transit times, delivery dates and Customs regulations. The Unit's specialists will solve all your problems.

BOAC's new Shippers' Service Unit is there to help you. Just say the word— 'SKYLOAD'

All over the world* B·O·A·C *takes good care of your cargo

Your local BOAC Appointed Forwarding Agent is also at your service.

BRITISH OVERSEAS AIRWAYS CORPORATION

with consumer interest concentrated more and more on quality products for which this is essential. Problems relating to raw material supplies were discussed at the recent meeting of the Flax and Hemp Confederation, held at Ostend.

If visitors to the recent textile machinery exhibition at Manchester found little of interest relative to processing flax fibre this was compensated for by the excellent range of machines for processing those long staple man-made fibres now firmly established in the economy of the N. Ireland textile industry. While the flax tow range of processing machinery is being used successfully to produce a wide range of yarn counts and qualities it is suggested that a still greater degree of adaptability in production could be effected by substitution at certain stages of manufacture of some of the newer and more specialised machines now on offer.

Jute, Fibre, Yarns and Fabrics

The main feature in jute markets during the past month has been the fixing of minimum prices by the Pakistan government. This had been expected for some time but the level of values fixed, especially for the lower grades, were higher than generally expected. Although it is understood that the rates fixed are intended to remain in force this season, there is a feeling the Pakistan authorities will find difficulty in maintaining these price levels especially for medium and lower grades of jute because of the lack of finance to carry large stocks. Just prior to the fixing of minimum prices Export Firsts were offered at £85 but the minimum rate was fixed at £5 per ton above this level. An approximate rise in values of the same size took place in most grades of fibre. The following is a list of minimum prices fixed by the Jute Board for the U.K. and Continent, c.i.f. 90 days sight:—

	£		£
Crack Firsts ..	142	Dacca Tossa-5 ..	107
Crack Lightnings	133	Dacca Tossa-6 ..	95
Crack Hearts ..	124	Crack Tossa-2/3 ..	124
Mill Reds	115	Crack Tossa-4 ..	107
Mill Firsts ..	106	Grade Tossa-2/3 ..	105
Mill Lightnings	90	Grade Tossa-4 ..	95
Mill Hearts ..	80	Outport Tossa-2/3	88
Grade Hearts ..	67	Outport Tossa-4 ..	76
Dacca Tossa-2/3	141	Crack Daisee-2/3 .	94
Dacca Tossa-4	127	Grade Daisee-2/3	88

There are still sellers making offers of fibre under the above price levels. This is due to the fact that a considerable amount of jute was purchased by middlemen prior to the fixing of minimum rates and they are willing to discount the market because of substantial profit margin. Spinners in the U.K. are not attracted by these offers and only a small movement has taken place in the past few weeks. Another factor that has slowed down buying of jute is the large purchases by Dundee spinners just before the minimum prices were brought into force. During the first half of October, the registered sales of jute to the U.K. amounted to approximately 85,500 bales, almost three times the consumption of the mills in that period.

The jute market is now quiet in Pakistan and offers of most grades are at minimum price levels. Top grades of white jute command a premium because of scarcity. However, holders of secured parcels are still discounting the market and it is possible to buy medium and low grades under official rates. Mill Firsts are available at £107, Mill Lightnings at £89, Mill Hearts at £79 and grade Hearts at £66. Grade Tossa-2/3 is freely offered at £104 and grade Tossa-4 at £94 with Outport Tossa-2/3 at £87. Crack Daisee-2/3 is lowest at £93 and grade Daisee-2/3 at £86 10s., c.i.f., U.K., Nov./Dec. shipment.

The Calcutta goods market has become dearer for hessians in near shipment position and a premium of 2s. 6d. per 100 yds., is being asked for current month shipment compared with one month forward. This scarcity in the near position has influenced U.K. buyers and most of the business now taking place is either for December or January shipment. During the second half of October U.K. buyers were showing interest and a substantial business was placed. Buying is still taking place but the quantities are now much smaller. Quotations are now at 65s. for 10 ozs. 40 ins., and at 48s. 4d. for 7½ ozs. with 11 ozs. 45 ins. at 72s. 5d. per 100 yds. f.o.b. Calcutta for November shipment, at 62s. 4d., 46s. 10d. and 68s. 9d. December and at 61s. 6d., 46s. 4d. and 67s. respectively, January shipment. Prices of sackings are working in reverse to hessians being cheapest in the current shipment position. B twills were quoted at 148s. November and at 148s. 3d. December.

The Calcutta mills now appear to be in a much better position with stocks of hessians at the lowest level for a very long time. Although nothing of an outstanding nature is taking place a fairly steady movement is taking place to most of the main consuming countries.

Demand for yarns and cloth in Dundee has improved greatly during the past month. Spinners in particular have found a steady demand for their output and in general mills are now fully booked for delivery two months ahead. Spinning mills are now running to the full capacity of the labour force available. The carpet and linoleum industries continue to take regular deliveries of yarns and everything points to this continuing in the future.

Business in cloth has also increased but not to the same extent as in the case of yarns. However, the position is now greatly improved with a steady offtake of the very wide material. In the heavy end of the trade there has been a substantial business played for sackings and tarpaulins and also to a lesser extent .or brattice cloth.

Although the jute industry is now in a much more satisfactory position as compared to during the summer months it is not booked as far ahead as is usual for the time of year. However, prospects are bright and the present demand should continue to keep mills and factories fully employed during the coming months.

Silk and Man-Made Fibres and Products

Activity has been more pronounced in recent weeks with yarn and cloth buying showing some improvement. A fair amount of business has been on spring account with new designs in dress, etc., fabrics creating considerable interest. Blends of cotton and viscose rayon and 100% rayon are going particularly well. In furnishings demand has increased with home markets placing larger orders than for some time. The demand for tufted carpets continues to expand, probably due to the relaxation in h.p. regulations, and blends of nylon and rayon and 100% viscose are in good request. As regards shirtings although it is too early to say that two-fold poplin will regain its popularity, indications show an improvement in demand for this cloth, with blends of cotton and "Terylene" in good demand. Sports shirts in 100% rayon continue to be well supported and this section of the trade market has almost settled into a niche of its own. The printed type of rayon shirting with drip-dry properties sells well.

The comparative lull in worsteds may continue for some little while. Most of the advance inquiry is for woollens, and wool/"Terylene" blends for suitings. Where furnishings are concerned, blends of wool with viscose rayon are selling fairly well, and the outlook is by no means pessimistic. The worsted section of the industry reports interest in blends of "Terylene"/wool, all-wool worsted being in a rather reduced call, probably due to (*a*) the fashion tendency towards woollens and (*b*) increasing demand for blended fabrics. "Acrilan" is finding an increasing use in the West Riding, and some good orders are expected for men's blended suitings of wool/"Acrilan."

Demand for bulked yarns in Macclesfield and Leek areas is better and it is thought that American products introduced to this country have probably created the demand for crimped nylon yarn. Considerably more interest has been shown in yarns of the "Saaba" type for both knitting and weaving. Towards the end of last year there was a general slow-down for knitwear but this year the overall improved pattern has been maintained. Inflow of spring orders is small but a good volume of Christmas orders should provide an increase in replacement trade. In smallwares, the present position is encouraging for the all-round improvement in orders instils a much better feeling regarding the immediate future.

There is a good call for cotton and "Terylene" sewing threads and in the last half of this year trade in this section has been very good generally. The Midlands have been experiencing a rather difficult period, partially due to imports from Continental countries. It is reported that Italian knitwear continues to attract public attention and prices of some overseas' goods are extremely competitive. The chief problems of the Midlands' trade are fine margins, especially with ladies' hose, and the falling-off of the half-hose trade.

U.S.A.: Piece Goods

European Trading Corporation, 2 Park Avenue, New York 16, N.Y., would like to act as sole U.S. distributors for U.K. woollens for coatings, suitings; skirtings, tweeds of all types, Shetlands; novelty blended fabrics of wool/"Terylene," etc.; wool/silk, wool/cotton, etc.; novelty yarn-dyed woven cottons for dress and sports shirtings; printed cotton dress fabrics; dress linens; jersey fabrics, etc. The corporation buy on their own account on a net basis, excluding all discounts and commissions, f.o.b. U.K. port, and sell throughout the U.S. Manufacturers interested should write direct, also copy correspondence to the British Consulate-General, 7th Floor, 99 Park Avenue, New York 16, N.Y.

Down go packing costs. And down goes packing time. Because with QUICK-WRAP Hessian Tubing it's a job that takes only minutes—by *unskilled labour*. Look, QUICK-WRAP benefits you all along the line. A better-looking pack, a better-fitting pack . . . QUICK-WRAP. Every time.

11 SIZE WIDTHS—TO SUIT ALL PRODUCTS *Suppliers to the Admiralty and Ministry of Supply*

'Quick-Wrap'

HESSIAN TUBING—*packs better all round*

Write for details to QUICK-WRAP TUBING CO LTD · JUTE MILLS · BOW COMMON LANE · LONDON E3 *TELEPHONE* EAST 3033

Notes and News

Wool Consumption in Britain

The rate of wool consumption in the U.K. during August appeared to be about the same as in July, states the Wool Industry Bureau of Statistics, but close comparison is made difficult on account of annual mill holidays which occur during those months. The recent slight improvement in the woollen section of the industry is reflected in the fact that, if the total for July and August is compared with those for May and June, consumption in the woollen industry was 7% higher, though it was 4% lower in the worsted section and fractionally lower in total. The July - August total for this year was about 11% lower than for the comparable period of 1957.

Top production in the July - August period was 3% below May - June and 15% below July - August last year, but worsted yarn delivery rate was 3% better in July - August than in May - June, though 15% below July - August last year. The wool fabric delivery rate appeared to be considerably higher in August than in July, though the July - August total was 12% below the corresponding period of last year. On the other hand, the rate of delivery in blankets during August showed a considerable seasonal increase over July and was also 7% higher than a year earlier.

* * *

New B.N.S. Office

British Nylon Spinners have taken over extensive new offices at 68 Knightsbridge, London, S.W.1 (Tel. No. KEN 6333). The whole of the B.N.S. Promotion Department including sections dealing with press relations, advertising, promotion services, merchandising and consumer research have moved from Upper Brook Street to the new address. So has the Southern Area sales manager. In addition, sections of the commercial department dealing with exports, industrial sales and market analysis have moved to London from Pontypool, which remains the head office of the company.

* * *

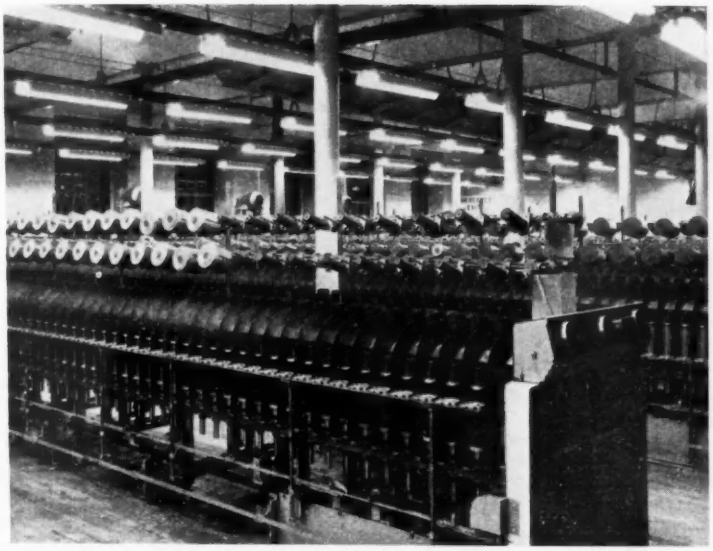
Textile Institute Service Medals

The Institute announces the award of the Service Medal to Mr. J. Tankard (British Rayon Research Association), and to Dr. F. O. Howitt (Wool Industries Research Association, Leeds). The Service Medal, first awarded in 1940, is granted for valuable services rendered to the Textile Institute.

* * *

Proofed Nylon for Barge Covers

For over 15 months this 160-ton Thames barge has been using nylon covers. Although they weigh only about half as much as conventional covers—making handling much easier—they are almost incredibly tough. The "Hydex" proofed nylon fabric weighs 16 oz./sq. yd. so that a 24 ft. square cover can, if necessary, be handled by one man. The fabric is impermeable, giving perfect protection to the goods underneath, and Maritime Lighterage Co. Ltd. who have had the covers on trial report no trouble from condensation even when carrying cargoes such as sugar and meal. Proofed nylon is easy to stencil with identification marks which remain clearly legible throughout the life of the covers. They are rot-proof and unaffected by salt water.



Lighting Scheme for Worsted Spinning Mill

Over 3,944 ft. of Mazda universal trunking has been installed in a new worsted spinning mill at Greenfield, Lancs., rebuilt by the Knoll Spinning Co. Ltd., following a disastrous fire in 1955. In all, 468 A.E.I. fluorescent lighting fittings have been used on Mazda universal trunking to illumine the three floors of the mill, occupying 14,560 sq. ft. Single-lamp open-ended reflector fittings, each housing a 5 ft. 80-w. fluorescent lamp, were used throughout the building mounted at a height of 10½ ft. spaced at 6 ft. 6 ins. centres on rows of trunking 9 ft. apart. The lighting intensity throughout the mill, for the spinning frames, creels and cone winders, is approximately 25 lumens/sq. ft.

"Hydex" proofed nylon cover on 160-ton Thames barge

3T CORD

Exclusive Goodyear development means stronger, thinner, more flexible transmission belting.

No splice failure
In construction the cord is wound continuously around two pulleys to produce a truly endless belt.

No ply separation
The single layer of load carrying cords round the pulley together, preventing internal stress.

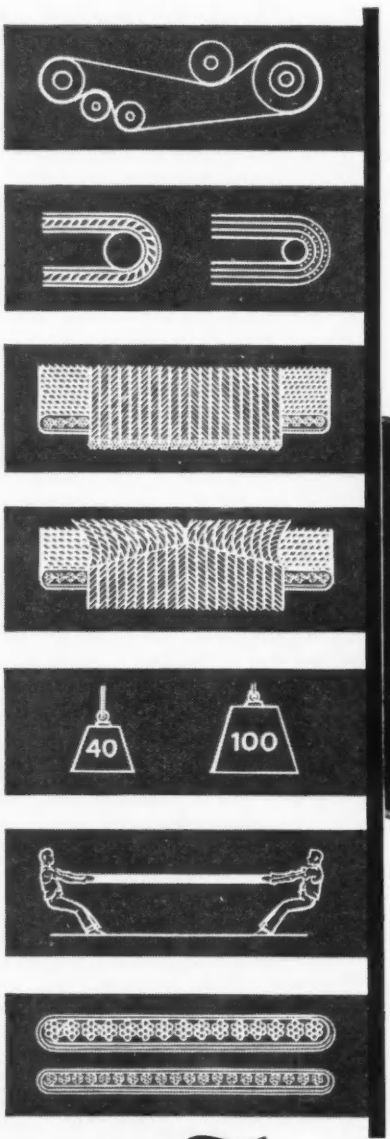
Less lateral movement
To neutralize lateral movement half the cords are twisted to the right and half to the left.

Elastic envelope
Designed to provide high friction surface to grip the pulley and transfer load to the cords.

Stronger 3T Cord
2½ times stronger than cotton and each filament of fibre is continuous, like the cord itself.

Less stretch
Triple Tempering removes surplus stretch but only to a degree where it does not hinder the flexibility of the fibre.

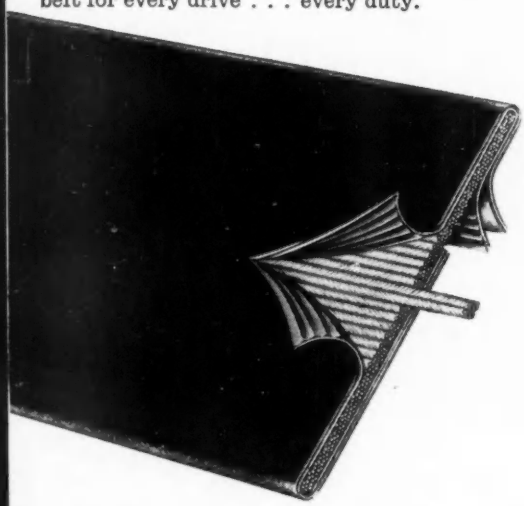
Thinner belt
3-T Cord belt is 25% thinner than belts of equal horse-power rating.



THE amazing new Goodyear 3-T cord process – successfully applied to motor car and commercial vehicle tyres – is also making transmission belts work harder, last longer and cost less for a given horsepower rating.

The synthetic cords are 'triple-tempered' – passed through a process at a controlled Tension and Temperature for a specific Time – to give them maximum strength and flexibility, minimum stretch. The result is that you can use a thinner belt – get improved flex life, longer wear, more efficient transmission and reduced maintenance.

There's a Goodyear 'job-designed' transmission belt for every drive . . . every duty.



NEW HD ENDLESS CORD BELT

The synthetic 3-T cords are *2½ times stronger* than cotton. This means longer service at lower cost on any drive. The special design of the belt eliminates splice failure and ply separation. HD Endless Cord costs no more, yet you get much higher horsepower ratings, better service all round.

GOODYEAR

INDUSTRIAL RUBBER PRODUCTS

Transmission Belting
Conveyor Belting · Hose
V-Belts · Industrial Fenders

THE GOODYEAR TYRE & RUBBER COMPANY (GREAT BRITAIN) LIMITED, WOLVERHAMPTON

Modern Methods in Sisal Production

Within six years of the introduction of sisal the Dominican Republic has built up what is claimed to be the largest sisal plantation in the world. This is the Sisal Dominicano Co.'s plantation at Puerto Viejo which has grown to 56,250 acres. The company's £3 million factory at the new port of Azua processes an annual 12,000 tons and shipments are made to Europe, U.S. Central and South America. Local consumption accounts for 75% of the company's production. The main Dominican buyer is Sacos y Tejidos Dominicano, C. por A., makers of bags, rope, baler and binder twine. The company's annual exports of binder twine and sisal thread alone amount to £2.5 million.

Technicians and engineers from Britain and Africa are employed and the plantation and factory are equipped with the most up-to-date machinery. The agricultural department is completely mechanised, and excellent roads in the plantation help transport of leaves to a network of railway lines, where they are carried by diesel locomotives and 1,000 wagons to the factory. One hundred tons of leaves are cut every day by 3,000 workers. In the factory the fibre is machine-dried, brushed, and packed into 250-kilo bales. Equipment includes decortication plants with 12 high capacity centrifuges, four automatic dryers, 10 brushing machines, eight hydraulic presses, and two vapour boilers of 250 KR each and four of 100.

* * *

Change of Address

The London office of Metropolitan-Vickers Electrical Co. Ltd., has been moved from 1-3 St. Paul's Churchyard, to 33 Grosvenor Place, London, S.W.1 (Tel. Belgravia 7011).

* * *

Sudan Cotton Sales Drive

Plans of the Sudan government to encourage cotton sales abroad include a series of goodwill missions. A party headed by the Director of Commerce, Industry and Supply, and including representatives of the Gezira Board and private growers, will make a European tour; another delegation is to visit Japan. These developments are reported from Khartoum by Barclays Bank D.C.O., which says there have been discussions of a proposal to invite some of the leading spinners of Western Europe and the U.S. to visit the Sudan. The overall export position to August 15 showed improvement over last year. Total exports amounted to 313,929 bales compared with 163,187 bales and 411,043 bales in the similar period of 1957 and 1956 respectively. The U.K. remained Sudan's best customer with 128,276 bales this year, about three times the volume bought last year. The second biggest customer was India (55,187 bales).

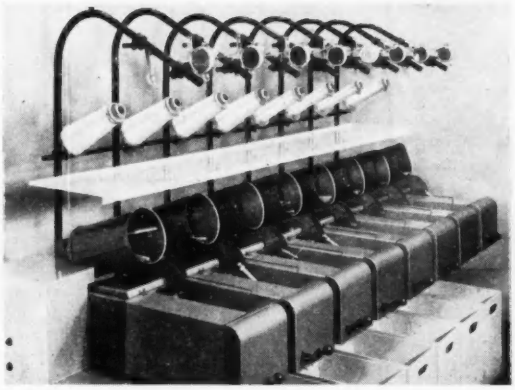
* * *

Change of Address

The London district office of British Thomson-Houston Co. Ltd. (manager, Mr. J. L. Dixon), has been moved to 33 Grosvenor Place, London, S.W.1. (Tel.: BELgravia 7011.)

CORRECTION

In the article appearing in "T.M." November, page 556, the caption with this block contained an error regarding the speed. It should have read — Muschamp Model SS100 high speed pirn winder equipped with the double disc compensators, set at 15 grammes, winding 100 den. filament rayon at 12,000 r.p.m.



Cutting Nylon and Acetate Cloth

Ambersil Formula One the aerosol-packed silicone spray marketed by Amber Oils Ltd., 11A Albemarle Street, London, W.1, is said to have been found to be invaluable in preventing fusion and build-up on the blades when cutting nylon and acetate cloths. This is the conclusion of a report to the company by Porth Textiles Ltd., Llwyypia, Rhondda, Glamorgan, who are large manufacturers of ribbons, etc. The report suggests the product would be particularly useful to users of band knife cutters on nylon cloth.

* * *

Acetate Factory Sold

British Celanese Ltd. have concluded negotiations for the sale of their yarn processing factory at Goose Green, Wigan, to Reed Corrugated Cases Ltd. The factory is at present working to full capacity on sizing and beaming acetate yarn and employs 22 staff and 206 work-people. During the next six months, however, these operations will be transferred to other yarn processing factories in the Courtaulds group at Little Heath, Nuneaton and Deeside. This move is in accordance with Courtaulds' policy of concentrating production in order to achieve maximum efficiency.

* * *

Change of Address

Witco Chemical Co. Ltd. announce that their Scottish office has been transferred to more commodious premises at 62 Robertson Street, Glasgow C.2.

* * *

Margin on Wool Goods

The President of the Board of Trade recently announced that Canada intends to restore the former margin of preference enjoyed by British wool goods in the Canadian market, which was reduced some months ago when Canada increased the duties on British goods but did not simultaneously increase duties on corresponding foreign goods. A Canada House spokesman in London subsequently stated that agreement with Italy was necessary before Britain's preference margin could be restored. Canada was seeking to increase the most-favoured-nation rate of duty on these goods, which principally affected Italy. When that was done the British preference margin would be the same as before, though duties in all cases would be higher.

New Agency

Following the recent visit of Mr. G. Godwin (managing director, Martonair Ltd.), to Italy, Vagnone and Boeri of Corso re Umberto 18, Turin, have been appointed agents for Martonair pneumatic equipment in Italy. Vagnone and Boeri also have offices in Milan and Rome.

* * *

Automatic Clutch Couplings for Germany

Twiflex Couplings Ltd., The Green, Twickenham, a member of Sheepbridge Engineering Group, have concluded an agreement with Zahnaderfabrik Renk AB, Gogginger Strasse, 7 - 81 Augsburg (13b), Germany, whereby the Renk company will have sole manufacturing rights for the range of "Twiflex" automatic clutch couplings and flexible couplings for Germany.

* * *

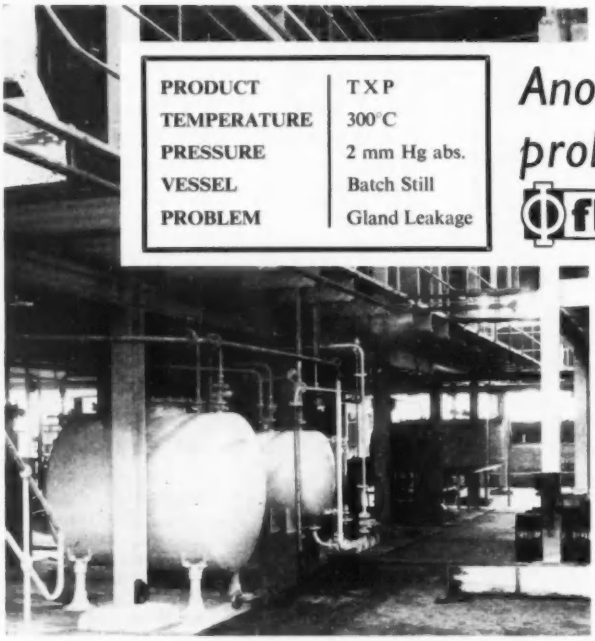
New Appointments

Mr. R. Chiles, managing director, Prince-Smith and Stells Ltd., has been appointed executive chairman, and Mr. O. G. L. Holmes, a director, has been appointed managing director. Mr. K. H. Preston has resigned from the Board of Prince-Smith and Stells Ltd., in view of his increased commitments.

* * *

U.S.A.: Curtaining Materials

Guerdon Industries Inc., 3783 S. Van Dyke Road, Marlette, Michigan, would like U.K. suppliers to quote for pre-shrunk, 45 ins. wide curtaining materials of various grades to be shipped in rolls; solid colours are preferred. If price and quality are satisfactory, they would purchase in lots of 50,000 to 60,000 yds. at a time. Guerdon Industries Inc. manufacture house trailers exclusively. In addition to their Marlette factory, they have branches in Idaho, California, Florida and Kansas. Suppliers interested should write direct giving both (1) f.o.b. U.K. port and (2) Detroit (Michigan), Jacksonville (Florida) and Los Angeles (California) prices in U.S. dollars. Firms should also copy correspondence to the British Consulate-General, 1865 Guardian Building, Detroit 26, Michigan.



PRODUCT	TXP
TEMPERATURE	300°C
PRESSURE	2 mm Hg abs.
VESSEL	Batch Still
PROBLEM	Gland Leakage

Another **tough** *sealing problem solved by* **flexibox** *mechanical seals*

Effective sealing of batch still agitator shafts is no easy problem. For example—Scott stills used by Coalite & Chemical Products Ltd. for the production of tri-xylenyl phosphate operate for 8-10 hours per day at a temperature of around 300°C and 2 mm Hg absolute pressure.

After endless trouble due to gland leakage, this leading chemical company decided to try a Flexibox mechanical seal when a new still was installed. Result — no leakage even after several years' operation, no shaft wear and no difficulty in maintaining vacuum.

ANOTHER 'SUCCESS STORY' FOR ***FLEXIBOX*** *MECHANICAL SEALS*

FLEXIBOX LIMITED

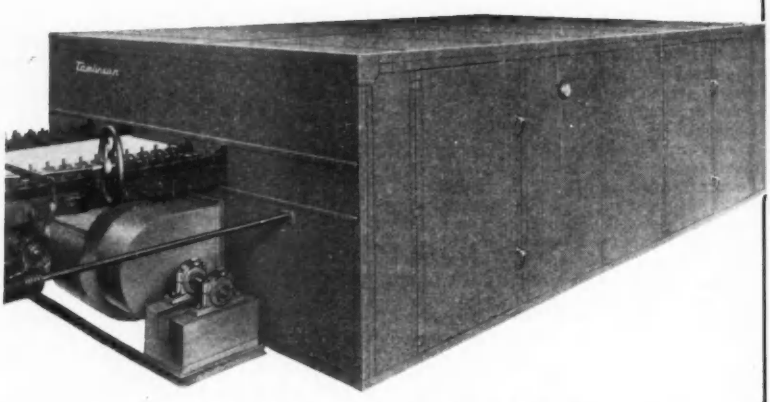
A MEMBER OF THE M.O.R. GROUP OF COMPANIES

Associated companies in the U.S.A., France and Germany
Agents and representatives in all parts of the world
Patents granted or applied for in all principal countries

Head Office and Main Works:
NASH ROAD · TRAFFORD PARK · MANCHESTER 17
Telephone: Trafford Park 1477 Telegrams: Flexibox Manchester Telex
Branch Factory: BALLYMENA · CO ANTRIM · NORTHERN IRELAND
Telephone: Ballymena 6424 Telegrams: Flexibox Ballymena Telex
London Office: 76 JERMYN STREET · LONDON S.W.1
Telephone: Whitehall 8411 Telegrams: Flexibox London Telex

STENTER ACCELERATION

A Tomlinson Stenter Accelerator consists basically of the most up-to-date type of air flow system, having high velocity jet cross nozzles which can be installed without any structural modification to your Stenter, supplied either with or without the Seelheet Enclosure. Increases in output of from 18% to 100% and savings of 66% in fuel consumption have been achieved with this equipment.



Illustrated is a Stenter Accelerator Unit complete with the Seelheet Insulated Enclosure installed at a Yorkshire Finishing Works.

MEANS MODERNISATION WITH SMALL CAPITAL OUTLAY
BY

TOMLINSONS (ROCHDALE) LIMITED

Telephone: ROCHDALE 3141/2
OLDHAM RD., ROCHDALE
Telegrams: "TOMLINSON ROCHDALE"

Lap to Yarn: New Condenser System

SPEAKING recently to a meeting of the Rochdale Cotton Spinning Mutual Improvement Society, Mr. H. Shenton (director, Moss Bridge Mill Ltd., Rochdale) gave members some interesting information concerning the new system of condenser spinning—the "Permo" spinning unit—of which he is co-patentee with Mr. F. Leach (F. Smith and Co., Whitworth). Commenting briefly on the need to become as efficient as possible in the use of labour, Mr. Shenton pointed out that it was first necessary to look at the condenser industry abroad to see what might be learned. The first thing that impressed was the fact that the mule had been almost entirely ousted by the ringframe, except in other processes such as can spinning, roving spinning and certain other specialised activities. In the past Lancashire had had a deep-rooted preference for the mule, continued Mr. Shenton, and the relative merits of mule and ring must have been argued many times. An enormous variety of cloths could, however, be made from yarns spun on the ringframe without anyone being able to tell the difference except than by microscopic investigation.

Another factor one would notice abroad was the absence of the derby doubler—another machine employed almost solely in Lancashire. Several tests had been carried out over the years and, more recently, by Shirley Institute, on the question of the relative evenness of yarn and count variation between the derby doubler and the Scotch feed. These tests, stated Mr. Shenton, had proved—provided supervision was of the best—that there was nothing to choose between the two systems; with the Scotch, however, lap regularity was much more important. One would also notice abroad that with the development of automatic weaving, the yarn was re-wound in order to present the best possible package for the loom shuttle.

What they had tried to do, continued Mr. Shenton, was to devise a scheme incorporating the undoubled advantages of this system and carry it a stage further by making it into one continuous process, at the same time maintaining a yarn quality good enough for most of the cloths manufactured from condenser yarns. Quoting figures published by Shirley Institute on the evenness of condenser yarn, condenser sliver (8·1% mean deviation; ring (12·5%); false twist (7·6%); mule (7·7%), Mr. Shenton pointed out that even the best possible drafting system hardly improved the yarn and it was decided, therefore, that their new spinning unit would not include a drafting system. The new unit actually comprises (*a*) breaker card, (*b*) Scotch feed, (*c*) finisher card and (*d*) tape condenser. Immediately after leaving the rubbing leathers the ends are carried without draft direct to the front rollers of the ring spinning unit. The spindles are arranged in two rows which means there are two front rollers, one for each line of spindles.

The yarn is spun on to large ring bobbins and in order that the unit can run continuously the spindles are doffed consecutively. The lift of one, two or more spindles is separately controlled so that the rings can be lowered independently from top to bottom positions. Lappet control is most important and, in order that the tension in spinning will not vary there is also independent control of the lappets. During the period of doffing, the ends from the front rollers are carried away by the "Pneumafil" system and this unit also draws off the side ends from the tape condenser and so keeps the waste from each machine separate and re-usable.

The entire machine has been designed to give continuous running and the synthetic rubbers do not require greasing. The spindle drive is arranged to give 1,000 - 6,000 r.p.m. through a variable speed gear which can be adjusted while running. A variable speed also used in building the bobbin made diameter control easily adjustable. In effect, with this system, condenser yarns are spun directly from the lap.

Regarding production, Mr. Shenton said the figures he would quote referred to a 48 ins. wide, 3 roller finisher coupled to the required number of spindles on the "Permo" spinning unit. The number of spindles will vary depending on the quality of raw material and counts being spun. Giving two examples, he said the first was from the type of yarn now being produced on the prototype machine running at Moss Bridge Mill—dyed garnetted rayon waste with 1½ counts. The number of spindles was 32, spindle speed 2,000 r.p.m., 2 turns per inch and the production 30 lbs./hour per sett. The second example was 6s spun from Peeler comber waste in which the spindle speed was 5,000 r.p.m., 8 turns/in., and production on 72 spindles 14 - 15 lbs./hour.

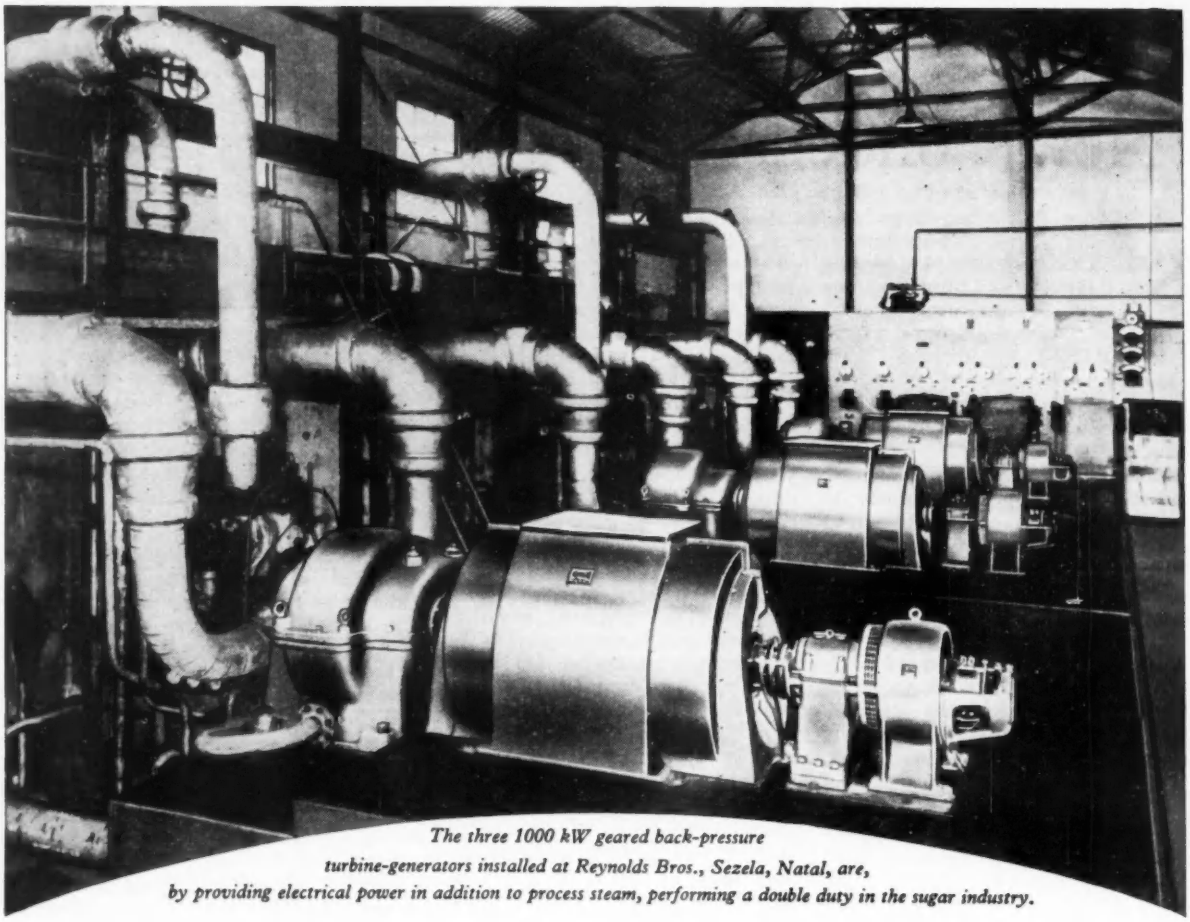
On the question of the number of operatives required, Mr. Shenton pointed out that it was hypothetical at this stage with only one unit running to say. However, close examination over the past few weeks had shown that on 1½s counts, one operative could look after three complete setts and on 6s counts he could attend 4 complete setts. This virtually meant that on 1½ counts one operative would produce from laps, 90 lbs./hour of 1½s yarn wound onto large packages. On 6s counts production would be 60 lbs./hour. The auxiliary labour required such as maintenance, grinding, etc., was the same as on conventional systems. The saving in labour cost would vary from mill to mill, said Mr. Shenton, but as one operative performed the function of card tenter (both breaker and finisher), spinner and winder, this saving could be upwards of 50%.

The spinning unit was made at F. Smith and Co., Whitworth. The card sett, made by William Tatham Ltd., contains their latest pattern 3-roller carding engine and Scotch feed. Perspex inserts have been made in the card cover so that carding can be observed as it takes place and dust extraction controlled with greater accuracy.

Change of Address

Heather Filters Ltd., manufacturers of air filtration equipment and distributors for the "Satomair" and "Humexair" humidity control equipment, have moved offices to 7 Kendall Place, Baker Street, London, W.1.

Geared Back-Pressure Turbines-



The three 1000 kW geared back-pressure turbine-generators installed at Reynolds Bros., Sezela, Natal, are, by providing electrical power in addition to process steam, performing a double duty in the sugar industry.

-cut your fuel costs

Great advantages can be gained by installing small back-pressure turbines for heating and process steam requirements in large factories. The back-pressure turbine is relatively cheap to install, occupies little space and requires only light foundations.

Please write for further details

A·E·I TURBINE-GENERATOR DIVISION

MANCHESTER AND RUGBY

A DIVISION OF ASSOCIATED ELECTRICAL INDUSTRIES LTD., incorporating the interests of M-V & BTH

WORKS AT MANCHESTER AND RUGBY, ENGLAND · GERMISTON, SCOTLAND · LARNE, NORTHERN IRELAND

B/L 702

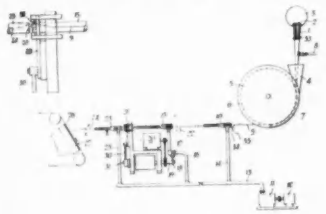
RECENT TEXTILE PATENTS

These abridgements are republished from specifications by permission of the Controller of H.M. Stationery Office. The full specifications can be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2. Price 3s. each.

785,935 Production of Bonded Webs

VERSIL LTD., *Rayner Mills, Liversedge, Yorkshire.*

Describes the production of webs or mats of bonded staple lengths of grouped filaments. Monofilaments 1 are extruded from a die plate 2 of a furnace 3 and are guided by a hopper 4 on to the periphery of a drum 5 having a V groove 6 whereby the filaments 4 are grouped together. The hopper may have an extension 7 extending round part of the periphery of the drum within the V groove. A suitable adhesive is sprayed on to the filaments from a nozzle 8. The bonded filaments 9 pass through a first ejector air traction device 10 which, in withdrawing the grouped filaments from the drum exerts traction and attenuates the filaments. The air traction



device is continuously operated by a blast of air supplied by a blower 11 driven by a motor 12 and conducted through a pipe 13 and a branch pipe 14. A second ejector air traction device 15 receives air from the pipe 13 through a branch pipe 16 under the control of a valve 17 operated by an eccentric 18 on a shaft 19 driven from a motor 20 so that the feed action of the device 15 is intermittently interrupted. A cutter device 21 is driven from shaft 19 so as to operate to cut the grouped filaments when the feed action of device 15 is interrupted. During non-feeding periods the grouped filaments fed continuously forward by device 10 may form a loop at an intermediate position, 22. A third ejector air traction device 23 is arranged at the side of the cutter to receive the staple lengths 24, the device 23 being continuously operated by a blast of air from the branch pipe 25 so as to tension the grouped filaments during cutting and to discharge the staple lengths on to a carrier 26 travelling at a slow speed over a suction box 27 which serves to retain the lengths on surface 26 while they are treated with a suitable bonding medium to form a web. In order to distribute the staple lengths over the width of the conveyor surface, device 23 may be mounted to pivot about a vertical axis and oscillate laterally. The cutter 21 comprises a blade 28 carried by a slide 29 operated through a connecting rod 30 from a crank 31 on the shaft 19. In the event of breakage of a filament between the drum and the furnace, the temperature at point 33 is sufficient to melt off the issuing portion of the filament to form a bead which eventually gravitates drawing a filament behind it and passes into the hopper 4 whereby it is grouped and bonded to the unbroken filaments and drawn forward by the device 10. A serrated blade 34 is arranged at the inlet end of device 10 to remove, by impact, the bead 35 and a portion of the filament behind it and thus avoid interference with continuity of operation of the apparatus.

785,978 Manufacture of Synthetic Filaments, Fibres, etc.

BRITISH NYLON SPINNERS LTD., *Pontypool.*

A process for the manufacture of lacunose filaments by continuously drawing in a solid state a travelling yarn or bundle of filaments, which have been melt-spun from a high molecular synthetic linear condensation polymer. One or more of the following conditions are chosen, namely, a high degree of crystallinity, a low degree of orientation and a low moisture content of the polymer, a high speed of drawing and a low temperature of drawing, so that an abrupt neck is formed in the filaments and cavitation expression occurs within the filaments. The position of the neck in the running filaments is stationary or only allowed to hunt up and down a restricted path. In one example, undrawn polyhexamethylene adipamide melt-spun yarn consisting of 34 filaments with half turn per inch Z (total denier 1110) is drawn at a rate of 20 feet per minute, the draw ratio being 4·1. The temperature of the undrawn yarn is 22°C. and it has a moisture content of circa 0·1%, having been in equilibrium with an atmosphere of 1% R.H. It is lustrous, being much brighter and having a much greater covering power than yarn made in the same way except that the latter yarn has a moisture content of 4·1%, having been in equilibrium with an atmosphere of 60% R.H.

786,063 Improved Loose Reed Looms

LOGAN, MUCKELT AND CO. LTD., 14 *St. Peter's Square, Manchester.*

Improved means for supporting the reed of a loose reed loom and allowing it to move clear of a trapped shuttle or other obstruction, and thereby to avoid the damage to the warp and also to bring the loom to rest. The reed is held in the sley by a releasable holding or gripping means both at the top and bottom, each such means being adapted to release the reed if the latter moves on to a trapped or misplaced shuttle or other obstruction during beat-up. The arrangement may be such that moderate resistance to the reed will effect only a swinging movement and actuate the loom stop mechanism, whereas a more than moderate resistance to the reed will effect its complete displacement and also actuate the stop mechanism.

786,081 Thread Illuminating Apparatus on Frames

E. WADSWORTH AND SONS LTD., *Broomfield Mill, Cleckheaton.*

Improvement in the mounting of thread illuminating apparatus on roving, spinning and twisting frames, the apparatus comprising a source of light near one end of the frame to project a parallel beam of light along the threads, the beam being directed vertically onto a mirror by which the beam is turned through 90° to pass horizontally across the lines of threads. The lamp house is mounted on a bracket carried by a pillar fixed to the frame, the mirror being separately mounted on the pillar.

787,028 Improved Raising Machines

TOMLINSONS (ROCHDALE) LTD., *Soho Works, Oldham Road, Rochdale.*

A wire card raising machine of the single or double acting type, is adapted to indicate a condition obtaining at the point of contact of the fabric and the rollers thereby providing an indication when the rollers are being driven at the appropriate speeds to give zero raising action. This indication is visible, audible or otherwise discernible without the need of mental calculation or comparison. Where the rollers are driven by means of chains passing over a sprocket on the cylinder shaft, the device may conveniently be associated with the respective chains so as to provide the visual indication according to the tensions of the chains.

787,077 Travelling Trolleys for Supplying Bobbins to Twisting Frames

E. WADSWORTH AND SONS LTD., *Broomfield Mills, Cleckheaton, York.*

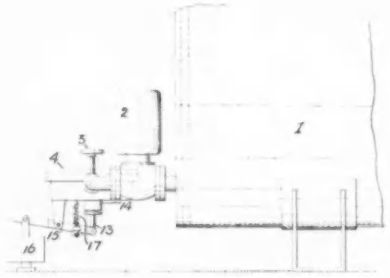
Improved travelling trolleys for supplying bobbins to pairs of back to back twisting frames, the trolleys being of the type guided by upper and lower rails on the frame and capable of travelling the length of the frames. The trolley comprises a carriage frame formed with end members, a vertical back and a base. Two pairs of horizontally mounted runners and one pair of vertically mounted runners are carried on the frame to engage rails supported on brackets arranged above and between the two twisting frames.

787,081 Pressure Dyeing Machine

F. SMITH AND CO. (WHITWORTH) LTD., *Sunnyside Works, Whitworth, Rochdale.*

Improved means for obtaining samples of dyed cloth to indicate the progress of dyeing in a closed pressure vessel. The dyeing is carried out in a pressure vessel 1, in which cloth travels through the dye from one batch roller to another. Dye from the vessel is circulated by a pump 2 through a

valve 3, a sampling chamber 4, and a valve 5 back to the vessel. Pillars 6 project downwards from the lid of the sampling chamber and have grooves 7 in which engage springs 8 carrying clips 9 to which are attached samples of cloth 10 which are stretched under a boss 11 on the chamber lid. Under the samples is a pressure plate 12 on a rod 13 passing through a gland 14 in the base of the chamber, which is raised or lowered by a lever 15 actuated by a solenoid 16 and supported by a spring 17 so as to keep the plate in the raised position in which the samples are pressed together and against the boss 11 so that the dye can pass around but not between them. The lid of the sampling chamber is held in



position by bolts 18 so that the samples can be exposed to the dye under the same pressure as in the vessel. At a convenient time, the solenoid is energised and the pressure plate is withdrawn from the samples to allow the dye to pass through them. After a predetermined time, corresponding to the time of travel of a point on the cloth through the dye in the vessel, the current to the solenoid is cut off, by an automatic timer, and the pressure plate is moved upwards again by the spring. This is repeated at each reversal of the batch rollers.

787,086 Improved Apron Drafting Apparatus

CASABLANCAS HIGH DRAFT CO. LTD., *Bolton Street, Salford.*

Relates to drafting apparatus of the kind employing superposed endless aprons having co-operating runs between which the fibres are guided during drafting. The apparatus has extra long co-operating apron runs, wherein the aprons are arranged to pass respectively around the upper and lower rollers of two pairs of apron supporting rollers. The top rollers of the roller pairs are adapted to receive weighting pressure alternatively to accommodate the apparatus to the drafting of different fibre lengths.

787,105 Wool Drawframe Needle Bar Mechanism

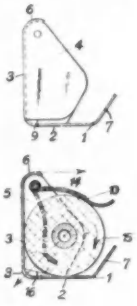
WHITIN MACHINE WORKS, *Whitinsville, Massachusetts, U.S.A.*

A drawing frame needle bar mechanism comprising a rotatable needle bar frame incorporating rigid, spaced disc portions. A series of needle bars extend between and are rotatably supported by the disc portions and needles are carried by the bars for entry into and withdrawal from the fibres upon rotation of the said disc portions A stationary cam track is adjacent the outer side of at least one of the disc portions, the track including inner and outer track surfaces. Needle bar crank members are engaged with the track surfaces to position the needle bars with respect to their axes. The inner cam track surface has a relieved section to free the cranks and permit rotation of the needle bars about their axes, the relieved section being located beyond the zone of withdrawal of the needles from the fibres.

787,223 Ribbon Loom Shuttles

A. SAURER LTD., *Arbon, Switzerland.*

Describes a shuttle for ribbon weaving looms. The portion 1 which holds the bobbin is provided with two planes 2 and 3 forming an angle, and parallel guide surfaces 4 and 5, forming the angle. The plane 3 has a rounded portion 6, and plane 2 is provided with a shoulder 7. An eye 8 is at the line of intersection of planes

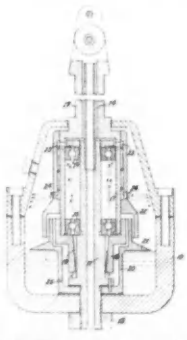


2 and 3, and an inlet slit 9 guides the thread from the outside on the left to the eye. The cover 10 is pivoted in the surfaces 4 and 5, and spring 14 tends to move the cover in the clockwise direction. When changing the bobbins, the cover is lifted and the bobbin 15 is placed into the shuttle 1, while at the same time the thread 16 is taken through slit 9 and placed into eye 8. When the cover is released, it pushes the bobbin 15, against the planes 2 and 3, while the thread is taken off the bobbin and leaves the shuttle through the eye 8. The thread passes from the eye along plane 3 to the portion 6, and then to the place where it is to be used.

787,285 Spinner Assembly for Twisting Machines

E. SCRAGG AND SONS LTD., *Sunderland Street Works, Macclesfield.*

A spinner assembly for a twisting machine comprises a reservoir 10, of transparent material bored at its base.



Through this bore is secured a spindle bolster 11 which is threaded to receive a nut 13 which clamps it so that the lower open end of the bolster projects just beneath the reservoir. At its upper end the bolster supports a narrow tube 14 which projects upwards out of the latter. At the top of the bolster and also about half way up its length are two ball races 15, 16, and these serve to support a spinner 17 which is shaped to surround the narrow tube and the bolster. At its lower end the spinner terminates in a reduced-diameter portion 18 which provides a conical space 19 between it and the bolster. Also mounted in the base of the reservoir is a sleeve 20, and this surrounds the lower part of the bolster and the part 18. On its outer curved surface a flange 21 is provided on this sleeve which acts as a baffle. A second sleeve 22 is provided which overhangs the sleeve 20 to prevent oil splashing from the reservoir into the sleeve 20. Passageways 23 and 24 are provided in the spinner and in the sleeve 22 so that the inside of the spinner communicates with the reservoir above bearing 15. A restricted passage 25 is also provided in the sleeve 20 so that oil can seep from the reservoir into the sleeve and to the space 19 between the portion 18 of the spinner and the bolster.

787,476 Improved Soil Resistance of Fabrics

A. SMITH INC., *Yonkers, New York, U.S.A.*

Treatment of fabrics to reduce the attraction of particles and to reduce their colour change due to pick-up and retention of particles. The fabric, or where the fabric has pile elements, the pile elements has a surface coating of discrete, preformed aluminium phosphate. The average particle size of the phosphate is not greater than about 70 millimicrons, the coating being present on the material in an amount (dry solids basis) of from 0·25% to 5% of the weight of the fabric, or pile elements. The coating has the property of reducing the tendency of the surface to pick up and retain soil particles. In one example, a dispersion made by mixing 1 part of aluminium phosphate ($AlPO_4$) of extremely small average particle size (70 millimicrons and below) in 99 parts of salt free water, was stirred vigorously for a period of 10 minuts. A pile fabric having 22 ounces per square yard of pile fibre was treated by immersion face down in this dispersion at room temperature to produce a solids pick-up of 1% on a dry basis on the pile weight. This corresponds to a pick-up of 0·011 ounce per square yard of exposed fibre surface area.

787,549 Apparatus for Gauging Size of Wound Packages

C. G. ROSENKRANZ, H. HALSTENBACH and A. PLUTTE, *Hatzfelder Strasse, Wuppertal-Barmen, Germany.*

Describes a winding machine in which the diameter of the winding can be gauged during winding in order to obtain the required accuracy. The winding is gauged by light rays which fall on a light sensitive cell and are interrupted to a greater or less extent by the winding and so cause the cell to control the winding. Owing to the optical gauging of the coil winding not only is any possible damage to the winding by the feeler prevented but also exact regulation of the winding becomes possible.

787,660 Bobbin Holders for Creels

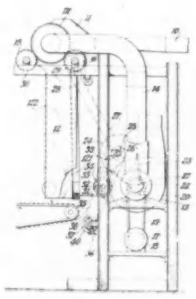
PLESSEY CO. LTD., 56 *Vicarage Lane, Ilford, Essex.*

A bobbin supporting device for suspending bobbins in the creels of spinning machines. A tubular sleeve has supporting means at one end for attachment to the

machine with bobbin supporting members carried by and adjacent the opposite end of the sleeve. A spindle is mounted within the bore of the sleeve, and a collar slides along the tubular sleeve and is connected to the spindle in a rotatable manner. Means are provided above and below the collar for imparting intermittent angular motion to the spindle as a result of two-way movement of the collar, to permit movement of the supporting members into or out of their bobbin supporting positions.

787,669 Improved Blowroom Apparatus
T.M.M. (RESEARCH LTD.,) *Hartford Works, Oldham.*

An improvement in the apparatus described in B.P. No. 719,495, the object being to provide means for enhancing the compactness of the column of material in a feed trunk to which it is delivered by the condensing cage. The apparatus comprises a duct 10 by which the material is delivered to a condenser 11 by which it is deposited in the feed trunk 12. The condenser consists of a perforated cylinder 111, the interior of which is exhausted by a fan 13



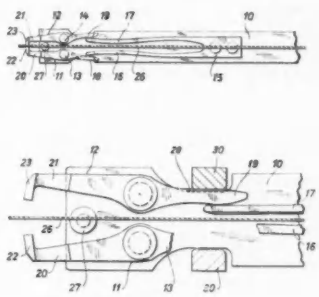
through the ducts 14, and which is supported upon rollers 15, 16. The roller 16 is driven by a motor 17 through belt-and-pulley gearing 18, 19, 20; a shaft 21; belt-and-pulley gearing 22, 23, 24; a shaft 25; and chain-and-sprocket gearing 26, 27, 28. The wall 121, is pivoted to a cross-member 29 which forms part of the frame 30 of the machine. The cross-member is movable towards and away from the side-wall 122 to vary the cross-sectional area of the mouth of the trunk. The wall 121 is linked by connecting-rods 31 to rotary cranks 32 mounted on a countershaft 33, the latter being driven through chain-and-sprocket gearing 34, 35, 36; and 37, 38, 39 by the shaft 25. A clutch 40 is incorporated in the connection between sprockets 36 and 37 and the clutch is arranged to be actuated, either electrically or mechanically, permitting the oscillation of the sidewall 121 to be interrupted as may be desired. The rotation of the cranks 32 has the effect of causing a rapid vibration of the wall and, by reason of the resultant alternate increase and decrease of the cross-sectional area of the trunk 12, the head of material deposited in the trunk receives a more uniformly compact condition.

787,719 Bobbin Drag Device for Flyframes
SPINNBAU G.M.B.H., 201 *Fargerstrasse, Bremen-Farge, Germany.*

A bobbin drag device, for flyer spinning machines, of the kind having upper brake parts secured to a bobbin-supporting plate and disposed on concentric circles and being adapted to co-operate with lower brake parts fixed to a spindle rail and disposed on correspondingly arranged concentric circles, in such a manner that superimposed brake parts on circles of one diameter, and superimposed braking parts on circles of another diameter come into action successively according to the increase in the bobbin weight. An upper brake part, disposed on an inside circle, is carried by a resilient intermediate member which is fixed by a screw to the bobbin-supporting plate, which screw at the same time serves as a catch for the bobbin. A lower brake part disposed on an outer circle is connected with the spindle rail by means of a part adjustable from the outside.

787,766 Thread Clamping Devices for Looms
SULZER FRERES, SOCIETE ANONYME, *Winterthur, Switzerland.*

Describes a clamping device for gripping a thread in a loom. On the carrier 10 of a thread returner of a loom provided with gripper shuttles, there is a clamping device, which includes two double-arm levers 11 and 12. A spring 15 with two split spring legs 16 and 17, bear on the right hand arms 18 and 19 of levers 11 and 12, so that the left-hand arms 20 and 21 of these levers, which carry clamp jaws 22, 23 are pressed towards each other and grip the thread 26 firmly. In its closed position the arm 20 bears on a stop 27. By this means the position of the clamping surfaces is located when the device is in its closed position. To this end the leg 16 of the spring is in addition provided with a greater spring force than the leg 17. The arms 18 and 19 are formed with inclined working surfaces



28 to co-operate with an element which controls the opening and closing of the clamping device by means of a fork 30.

787,822 Improved Dye Jig
A. and P. LIBBRECHT, 39 *Rue de l'Epeule, Roubaix (Nord), France.*

Describes a machine of the "jigger" type for dyeing fabrics while spreading them, comprising a pair of drums which alternately act as fabric receiving and delivering drums, and a rocker device for spreading the fabric provided with fabric deflecting rollers. The rocker device rocks towards the fabric receiving drum in response to a reversal of the direction of travel of the fabric. Adjustable abutment means are provided to co-operate with a member connected to the rocker device for preventing the device from rocking to within a predetermined distance from the fabric receiving drum.

787,854 Flyer Spinning Machines
T. M. M. (RESEARCH) LTD., *Hartford Works, Oldham.*

A spinning unit comprises a ring flyer having a thread guide mounted for reciprocatory movement on it, with a spindle co-axial with the ring flyer. A cup is fixed in the top of the ring flyer to surround the upper part of the spindle, the cup and the flyer being slotted to lead yarn from the thread guide to the interior of the cup. A cup base support is mounted on the spindle beneath the cup and is adapted yieldably to resist movement away from the cup. The arrangement is such that, the flyer and spindle being driven at different speeds, yarn fed through the thread guide is wound within the cup first upon the cop base support and subsequently upon the spindle as the support member is forced along the spindle by the accumulation of yarn beneath the cup.

PRESS PAPERS and ELECTRIC HEATING PAPERS
FOR
ALL TYPES OF CLOTH PRESSING PLANTS

Telephone : ARTHINGTON 100 (3 Lines)
TELEX No. 55-103

B. S. & W. WHITELEY, LTD.
POOL PAPER MILLS,
POOL-IN-WHARFEDALE, YORKS.

Telegrams : WHITELEY, Pool-in-Wharfedale.

CLASSIFIED ADVERTISEMENTS

Classified advertisements are inserted at the rate of 3/- per line.

Machinery, Plant, Accessories For Sale

MANUFACTURERS of sectional water storage tanks, 50 to 40,000 gallons capacity. Sewage and Effluent Pumps. G. L. Murphy Limited, Imperial Works, Menston, Nr. Leeds.

Machinery, Plant, Accessories For Sale

ARUNDEL Cone Winders, both new 1956, for Sale. One 100 S.P.S. Paper Cone Cotton Machine, and one 60 S.P.S. Worsted Coner with Conditioner. Write Box TD2, "Textile Manufacturer," 31 King Street West, Manchester 3.

Agents Wanted

Winding Machinery

MAKERS in Holland need agents in U.K. to stimulate sales of a range of machines of proved worth to the textile industries. Box TD3, "Textile Manufacturer," 31 King Street West, Manchester 3.

"Steampacket"

CRADLEY'S 80% EFFICIENT OIL-FIRED BOILER

Compact
Automatic
Smokeless

CRADLEY BOILER CO. LTD.,
CRADLEY HEATH, STAFFS.
Telephone: Cradley Heath 66003

Situations Vacant

TEXTILE RESEARCH MANAGER

Turner Brothers Asbestos Co. Ltd. Rochdale

Applications are invited for the post of Textile Research Department Manager in this large company which produces a wide range of textiles, plastics and rubber products. The appointment involves the executive control of a key department in a substantial research and development organization, and offers considerable variety and scope for original work. The salary range is attractive.

Candidates should preferably be between 30 and 40, with a university degree or equivalent, together with F.T.I. or A.T.I. and industrial experience. A sound understanding of the chemistry and physics of textile fibres, familiarity with modern techniques of fibre evaluation and a knowledge of modern textile machinery are essential, and experience of inorganic fibres would be an advantage.

Normal pension benefits and recreational facilities are available and assistance can be given with house purchase. Applications, which will be treated confidentially, should contain details of age, education, experience and be addressed to:—

The Chief Personnel Manager, Turner Brothers Asbestos Co. Ltd., Rochdale, Lancashire.

PATENTS

J. OWDEN O'BRIEN & SON

CHARTERED PATENT AGENTS

Agents for procuring Patents and Registering Trade Marks and Designs
Lloyds Bank Bldgs., 53 King St., Manchester
Telephone No.: BLAckfriars 7782

BALL DRAG

for all kinds of Winding

TEXTILE SPECIALISTS

Slub and Snarl Catcher
Adjustable Yarn Clearer
Elastic Loom Buffers
Universal Textile Scissors
Tension for Beaming Frame
Wires for Warp Stop Motion
Hairy and Plain Picking Bands
Patent High Draft Unit for Spinning

J. O. WHITAKER (Accrington) LTD.
50a PITT ST., ACCRINGTON Tel. Accrington 2248

NEW HIGH-SPEED PORTABLE
ELECTRIC CLOTH CUTTERS

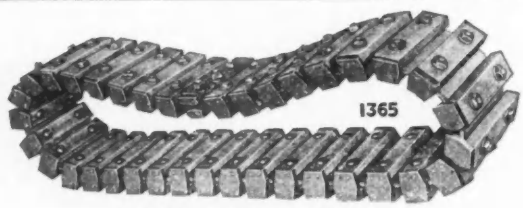
For Bulk Cutting of all Textiles; Cloth, Fabric Duck, Felt, Canvas, Wool. Wadding Waste, and general making-up trades, etc. Will do the work of six hand cutters.

Straight and Round Knives.

Built here in original famous "UNITY" Registered models.

L. LINZ & SONS LTD.
PARK STREET, Manchester 3
Blackfriars 5131/2 Estd. over Half-a-Century

Please mention the "Textile Manufacturer" when replying to advertisements



Telephone: BRADFORD 41251 (5 lines)
Telegrams and Cables: Lindsay Bradford Telex (Telex No 51147)

WIDE-VEE BELTS FOR SPEED-VARIERS
Spare belts for the Lindivarier from stock

Belts made specially for other makes of Speed Varier and Expanding Pulley. Jointed or endless. To suit flat driven pulley when required. Please give fullest particulars, sending a specimen belt if at all possible.

Mechanical **HENRY LINDSAY LTD.** *Engineers*
P.O. Box 97, Mansfield Road, Bradford 8, Yorkshire

EST. 1887

Precision machined components in all Plastics and allied materials *for Separators, Winding Machines, Insulators, Stop Motions or Trip Mechanisms, Silent Gears, etc.*

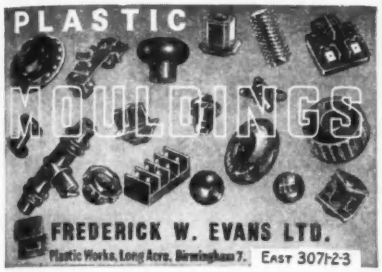
Lancashire Representative: Mr. J. Harrison. Phone: Freckleton 382

UHLHORN BROS. LIMITED

EBONITE (Vulcanite) **RESILON** (Synthetic resin bonded paper)
RESILON (Synthetic resin bonded fabric)
COROSITE (Acid resisting material)
GLASS-FIBRE LAMINATES
VULCANIZED FIBRE (Red, Black or Grey)
FEROBESTOS, ETC.
P.V.C. (unplasticised)

UHLHORN BROS. LTD., 51/53 CITY ROAD, LONDON, E.C.1

CLASSIFIED ADVERTISEMENTS



TOOTILL & SNAPE LTD.
VICTORIA WORKS
RADCLIFFE, nr. MANCHESTER
MAKERS OF ALL KINDS OF
SPINDLES
FOR WINDING COTTON, SILK, ETC.
STEEL COP SKEWERS
Plain Single and Double Spring

SOVATEX
FOR SPOTTING OUT MINERAL OIL AND OTHER DIFFICULT STAINS
STANDARD CHEMICAL COMPANY
Proprietors: HORSFIELD BROS. LTD.
CHEADLE · CHESHIRE
Telephones: GATLEY 5261 and 3543

WOOLLEN & WORSTED YARN MANUFACTURE
By J. W. RADCLIFFE

PRINCIPAL CONTENTS

Selection of raw materials—Physical Structures of Wool and other fibres. Selection and Sorting—Comparisons in Woollen and Worsted Yarn Manufacture—Wool Scouring—Wool Drying—Blending—Setting and Speeding Arrangements—Woollen Carding—Back-Washing—Preparing and Drafting—Combing—Top Testing—Drawing Operations—Cone Drawing—French Drawing—Comparisons of Spinning Machinery—The Self-acting Worsted Mule—Mule Spinning—Standard Twists for various types of Yarns—Types of Fancy Yarns—Yarn Counts—Twisting and Reeling—Modern Scouring Plant.

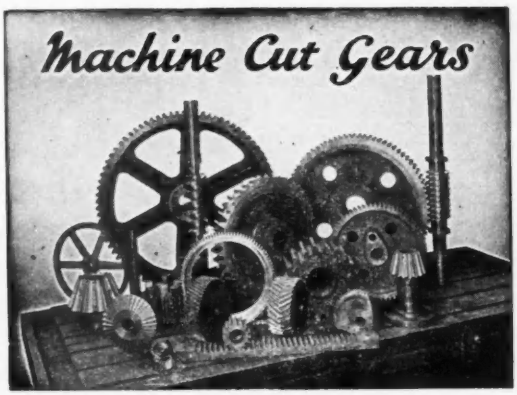
Cr. 8vo. 420 pages with 170 illustrations.

Price 21/- net **By Post 21/9**

May be ordered from any bookseller or direct from the Publishers

EMMOTT & CO. LTD.
31 KING STREET WEST, MANCHESTER 3
London: 158 Temple Chambers, Temple Ave E.C.4

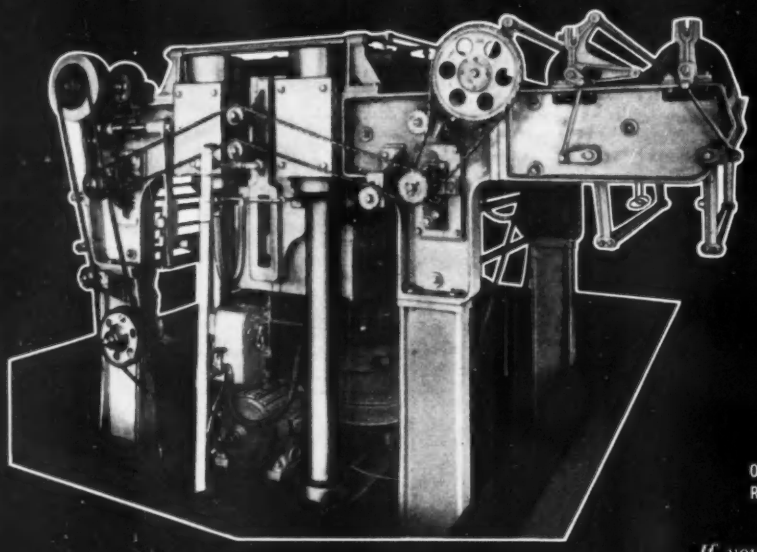
Plant Your Factory Grounds
THE LIVING ADVERTISEMENT
NOTCUTT'S
112 page catalogue lists over 1,800 varieties of Ornamental Trees and Shrubs; Roses, Hedging Plants, Perennials, etc. Illustrated with superb colour plates.
Special quotations for Planting Schemes
The Nursery, WOODBRIDGE · SUFFOLK

Machine Cut Gears

SPURS
BEVELS
WORM WHEELS
WORMS
RACKS
CHAIN WHEELS
HELICALS
SCREWS
SILENT GEARS
COMPLETE SUPPLY OR CUTTING ONLY TO 7 FEET DIAMETER
General Machine Castings made to customers' Patterns. Low prices for Planing, Boring, Turning, Screwcutting
Send your inquiries to:—
GREENWOOD'S STANDARD GEAR CUTTING CO. LTD.
New Bond Street, Halifax *Telephone: Halifax* 5217/8. *Telegrams: "Gears"*

GEORGE EMMOTT (PAWSONS) LTD.,
OXENHOPE, KEIGHLEY

SPRINGS OF EVERY DESCRIPTION
Tel.: 2114 Haworth. **Telegrams: Emmott, OXENHOPE.**

the **HATTERSLEY-PICKARD** hydraulic press for WOOLLENS and WORSTEDS



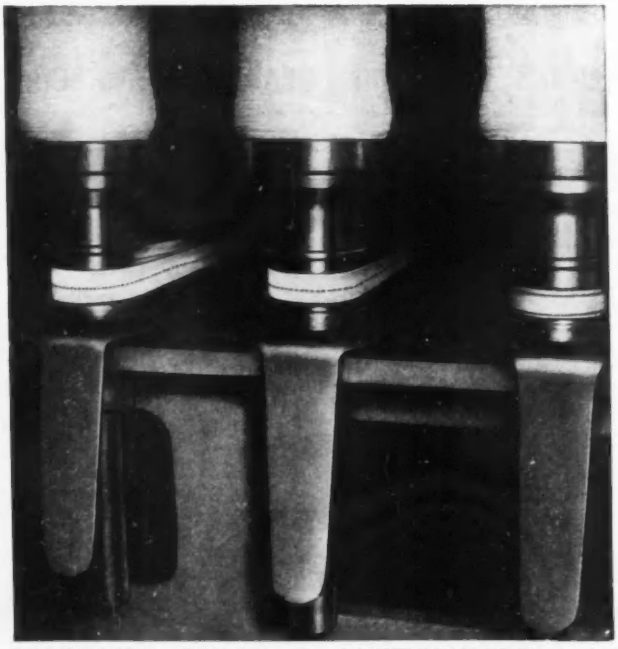
★ Fully Automatic
★ Flat pressing between papers
★ Large output with economy in operation

Other machines available for the pressing of Cottons, Rayons, Poplins, Linings, etc.

If your problems are pressing, consult . . .

Hattersley Pickard & Co. Ltd.

Hunslet Engineering Works, 123 Jack Lane, Leeds 10 • Phone: 32261 (6 lines) • Grams: "Whirlwind, Leeds 10"



BLACKBURN'S

SPINDLE BANDS AND TAPES

Also Carpet Binding and Heading Tapes

Spindle Tapes in any weave or material.

AMERICAN OR EGYPTIAN OR NYLON.

Cotton Warp, and Nylon Weft & Edges.

Tapes and Webbing for all purposes.

Double Loop Bands and "Elaston" Mule Bands.

T. BLACKBURN (BRIGHOUSE) LTD.

EST. 1820

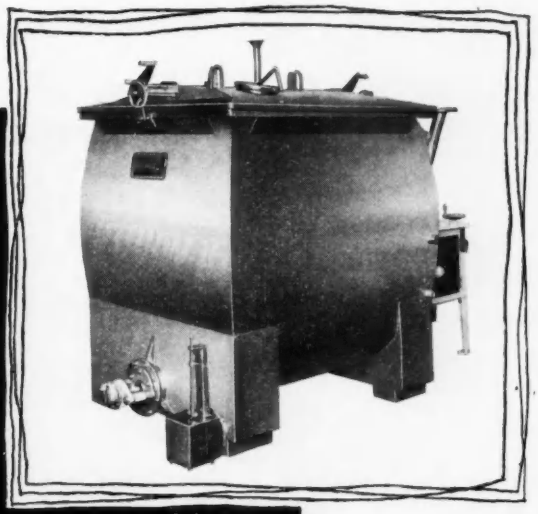
Incorporating Jonathan Turner, Owler Ings Mill, Brighouse.

PHOENIX MILLS & HUTCHINSON LANE, BRIGHOUSE, YORKS.

TELEPHONE: 1612-3

Here's the NEW

F.T.M. 'PLUSFLO' Hank Dyeing Machine



1. **FLOW FROM FOUR SIDES**
2. INFINITELY VARIABLE ADJUSTMENT for hanks from 54" to 72" in length by single handwheel adjustment.
3. Maintains CONSTANT LIQUOR RATIO level of liquor being reduced accordingly.
4. COIL HEATED—no make up.
5. CONSTRUCTION follows FTM Registered 'CURVILINEAR' design, requiring no external supports.
6. PRESSURE SEALED to ensure temperature of 212° F if required.
7. PROPELLER SPEED can be infinitely adjusted to give flows in excess of 4 gallons per lb. per minute without turbulence.
8. DOUBLE HANK POLE system, incorporating staggered telescopic poles requiring no locking.
9. VISUAL OR RECORDED INSTRUMENTATION provide perfect control and repetition of any condition.

FREEMAN, TAYLOR MACHINES LTD.

Dept. E. Necton Street, Syston, Leicester, England · Telephone: Syston 3301 (5 lines), Telegrams: 'DYEMAC' Leicester

---

Manufacturers of
CARD CLOTHING
and
Patentees of
"ROTOMATIC"
Fancy Card Clothing

JOSEPH SELLERS & SON LTD

CLECKHEATON *Established 1840* **YORKS**

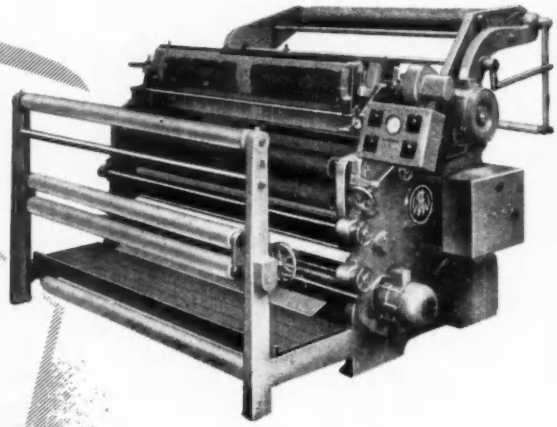
Telegrams :
Sellers, Cleckheaton

Telephone :
Cleckheaton 2369 & 2360

Unsurpassed for Performance

CHARLESWORTH-WHITELEY

Single Cylinder Carpet and Felt Shearing Machine



WIDTH: 78″ on spirals but varied to suit customer.

CYLINDER: with 15 file cut bayonet spirals—driven by high torque motor for quick acceleration.

DRIVE TO MACHINE: through variable speed gear giving speeds of 3 to 12 yards per min. Electro-magnetic brake eliminates over-run of material when stopping machine.

BRUSHES: Separate brushes for cleaning back and face of material. Setting up brush for face of material.

SCRUBBER: for use on felt, consists of a balanced roller covered with sand cloth which oscillates across the face of felt as it revolves.

MICROMETER ADJUSTMENT of shearing head.

MACHINE fitted with fixed or slide bed.

PUSH BUTTONS control all motors. Indicator lights when running. Speed indicator.

CHARLESWORTH-WHITELEY
TEXTILE FINISHING MACHINES
Unsurpassed in Quality and Performance, are backed by the Accumulated Experience of over a Century

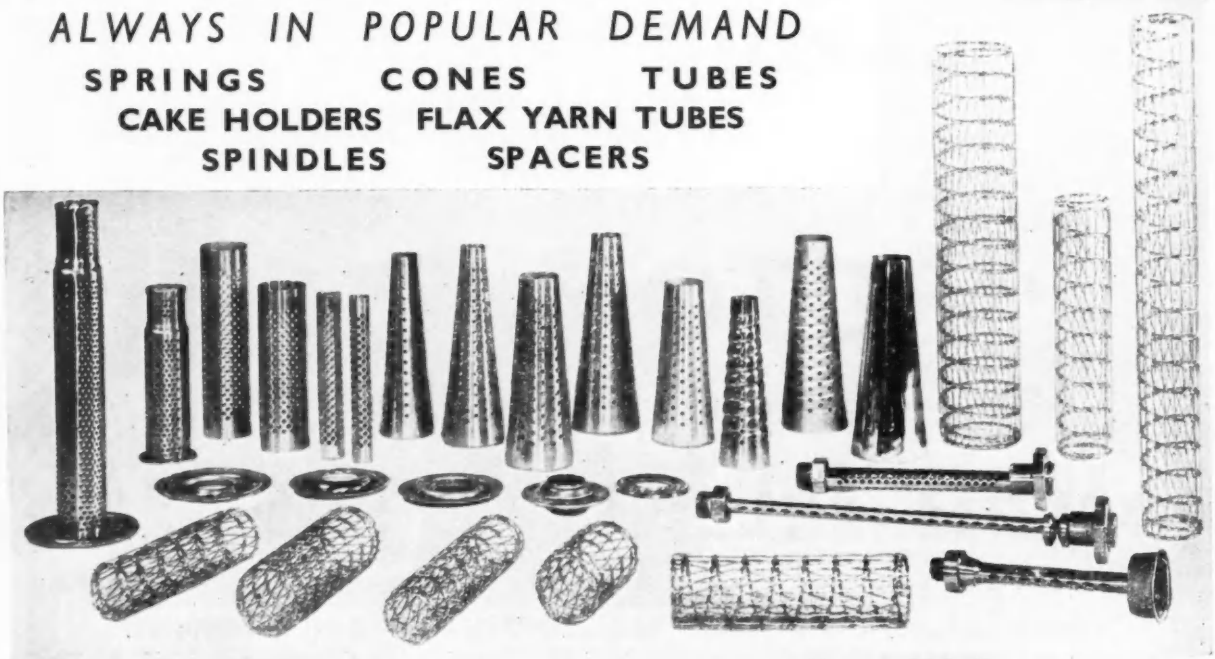
FOR ALL YOUR TEXTILE FINISHING MACHINERY REQUIREMENTS CONSULT:

WM. WHITELEY & SONS, LTD
Incorporating **J. CHARLESWORTH**
PROSPECT & UNION IRONWORKS
HUDDERSFIELD, ENGLAND
TELEPHONES: HUDDERSFIELD 4410-1
TELEGRAMS & CABLES: DRYING, HUDDERSFIELD

STAINLESS STEEL DYE CENTRES

ALWAYS IN POPULAR DEMAND

SPRINGS CONES TUBES
CAKE HOLDERS FLAX YARN TUBES
SPINDLES SPACERS



DAVIDSON, MacGREGOR & Co. Ltd., BANCHORY WORKS, HARTLEY WINTNEY, Nr. Basingstoke, Hants, England
Tel: HARTLEY WINTNEY 302 Cables/Grams: KILTY, HARTLEY WINTNEY

ESTABLISHED 1795

JOHN DIXON & SONS

LIMITED

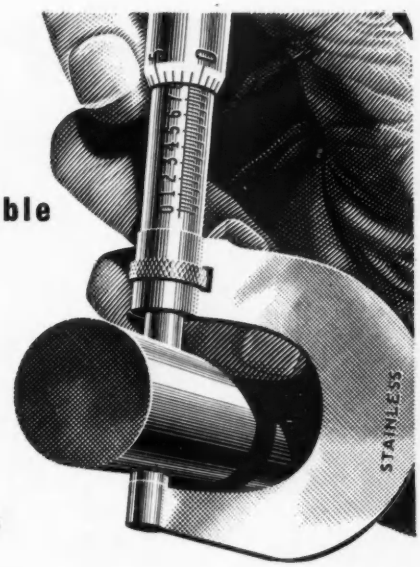
BOBBIN MANUFACTURERS

STEETON, NR. KEIGHLEY

Telephone : STEETON No. 2247 (2 lines)
Telegraphic Address : "DIXONS, STEETON"

Bradford Exchange : Monday and Thursday
Manchester Exchange : No. H2 Pillar, Tuesday

Negligible shaft wear with *these bushes



'ORKOT' bearings, first proved in rolling mills, are now available for bushing and general bearing applications.

If your bearing problem is one of

CHEMICAL ATTACK,
SHAFT WEAR,
BEARING LIFE,
MAINTENANCE,
LUBRICATION,
BEARING POWER LOSS,

'ORKOT' may be the answer.

* Orkot
BUSHES

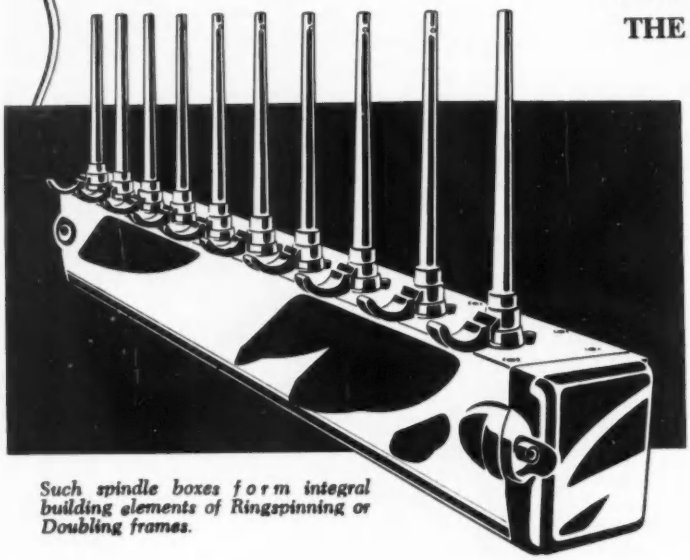
UCC
CHEMICALS FROM COAL

Write to:—

UNITED COKE & CHEMICALS COMPANY LIMITED
(SALES DEPT. 381) P.O. BOX 136, HANDSWORTH, SHEFFIELD 13
Tel: Woodhouse (Sheffield) 3211 *'Grams*: Unichem, Sheffield

OB1

HISPANO SUIZA
(SUISSE) S. A. GENEVE



Such spindle boxes form integral building elements of Ringspinning or Doubling frames.

WHAT ARE THE ADVANTAGES OF THE HISPANO SUIZA SPINDLE?

Positive drive, ideal lubrication, elimination of tape drive, no slip, no tinroller wind, no centering of spindles.

All spindles turn always with equal speed.

Few ends down, easy maintenance, low power consumption.

- ✱ Higher spindle speeds.
- ✱ Clean Frames.
- ✱ Regular twist.
- ✱ Better yarn.

THESE ARE THE ADVANTAGES OF THE HISPANO SUIZA SPINDLE

NEW

FILMAT BOWLS FOR SCHREINER CALENDERS

Produced in the form of discs, "Filmat" is mounted on the bowl centre as a pre-compressed covering. Middleton Bowl Works have sole British Manufacturing Rights for "Filmat", but have Selling Rights throughout the world.

The recent trend towards "Schreiner" calendering Synthetic Fibres to produce opaque finishes, has made it necessary for bowls to be absolutely homogeneous. "Filmat" with its greater elasticity and ability to withstand greater "nip" pressures is the complete answer to this problem.

MB

MIDDLETON BOWL WORKS LIMITED

MIDDLETON MANCHESTER

dm MBS

SEE THE
SPRING
YOU NEED HERE ?
Cut production costs with TERRY Wire Circlips (Square Section)
We make first-class Flexible Shaft too.
May we quote you?

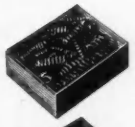
No? Well, it would take all the pages of this magazine—and a lot more—to show in full the immense range of **TERRY'S ASSORTED SPRINGS** in all their variety—compression, expansion, heavy, light, long, short, any gauge you want. But in our **BOXES OF ASSORTED SPRINGS** you'll certainly find the *very* spring you've been looking for. Why not let us send you our full illustrated list of BOXES—post free?

HT23A

Interested in Spring Design? Send for 'Spring Design and Calculations'— Post free 12/6

TERRY'S
ASSORTED SPRINGS

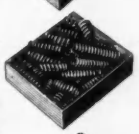
HERBERT TERRY & SONS LTD. REDDITCH, WORCS
(Makers of quality Springs, Wireforms & Presswork for over 100 years)



No. 757.
Extra Light Compression, 1 gross Assorted, ⅛" to ⅜", ½" to 2" long, 27 to 20 S.W.G. **15/-** each.

No. 758.
Fine Expansion Springs. 1 gross Assorted ⅛" to ⅜", ½" to 2" long, 27 to 20 S.W.G. **15/-** each.

No. 753.
3 doz. Assorted Light Expansion ¼" to ½" diam., 2" to 6" long, 22 to 18 S.W.G. **10/6** each.



No. 98A.
3 doz. Assorted 1" to 4" long, ½" to ¾" diam., 19G to 15G. **5/6** each.

No. 388.
½ gross Assorted Small Expansion Springs. ¾" to 1½". 18G to 21G. **9/6** each.

No. 760.
3 doz. Assorted Light Compression Springs. 1" to 4" long, 22 to 18 S.W.G., ¼" to½" diam. **6/6** each.

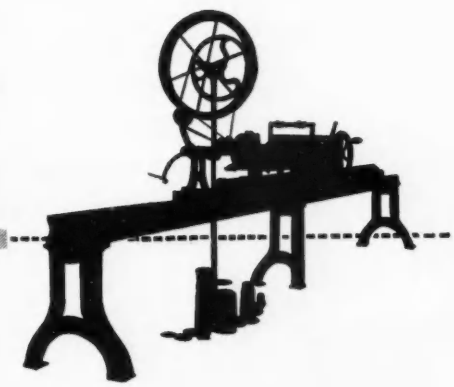
No. 1024.
20 Compression Springs 12" long. ⅛" to ½" diam., 24G to 18G, suitable for cutting into shorter lengths; and 30 Expansions 1½" to 12" long, 5/32" to ⅝" diam. 22G to 16G. **24/-** each.

✱ *A Complete Range of—*

Heald and Reed Making Machinery

TO MAKE PITCH BOUND REEDS IN STANDARD SIZES OF 96", 120" & 150" WIDE

- **WIRE ROLLING & WIRE POLISHING MACHINES**
- **COTTON HEALD KNITTING & WIRE HEALD MAKING MACHINES**



✱ *Full details on request from:-*

WM. HAMPSON (OLDHAM) LTD.

LYON WORKS · OLDHAM · LANCASHIRE ·

TELEPHONE MAIn (OLDHAM) 3617 TELEGRAMS HEALDREED OLDHAM

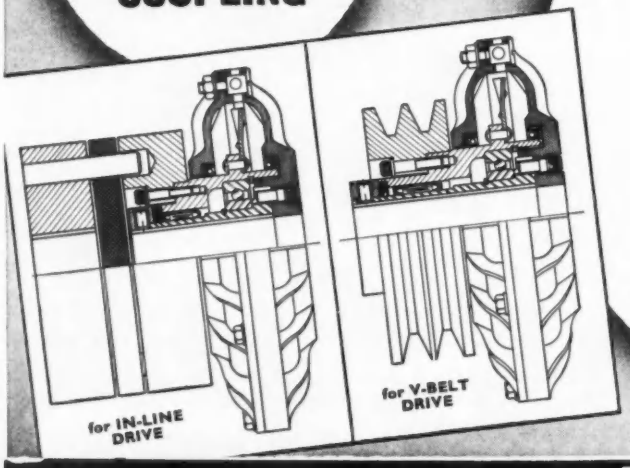
THE DRY FLUID CENTRIFUGAL COUPLING

– a new 6 point approach to POWER TRANSMISSION PROBLEMS

1. Starts high loads smoothly with smaller power units and eliminates the starting snatch which is often troublesome in the papermaking, wire, printing and textile industries.
2. The necessity of using electric motors with high starting torque characteristics together with expensive switchgear is eliminated.
3. Prolongs the life of chain or V-belt drives and other components associated with the transmission of mechanical power.
4. Invaluable for power factor correction problems, as it reduces peak electrical loadings.
5. Can be made to slip at a predetermined overload and so prevent damage to a power unit.
6. At full load/speed almost 100% efficiency is obtained (one revolution slip per 10,000 revolutions).

SPECIAL DESIGN FEATURES

(i) **Ball and roller bearing races used between the inner and outer hub members.**
(ii) **Mechanical type, Neoprene rubber seals.**
(iii) **Couplings can be used for either in-line or belt drives and a pulley or flange can be fixed direct to the outer driven member via the medium of bolts.**

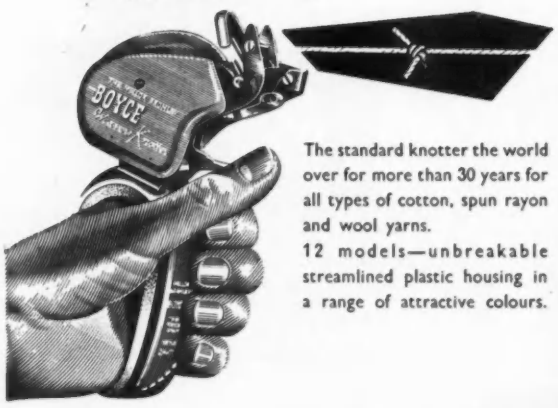


If you require further information or have a transmission problem, please communicate with:

POWDER COUPLINGS LTD.,
A Member of the Specialloid Group of Companies
20 BLACK BULL STREET, LEEDS, 10
Telephone LEEDS 20936 & 31471/7

Mellor Bromley Knotters

THE 'BOYCE' WEAVERS KNOTTER



The standard knotter the world over for more than 30 years for all types of cotton, spun rayon and wool yarns.

12 models—unbreakable streamlined plastic housing in a range of attractive colours.

THE Mellor Bromley FISHERMANS KNOTTER

(Mes-Dan world patents)

FOR SLIPPERY AND DIFFICULT YARNS

MODELS L24 and L26 for worsted weaving yarns.

MODELS L20 and L22 for fine denier nylon and filament yarns.

MODEL L30 a heavy unit for coarse counts.

MELLOR BROMLEY & CO., LTD.
(Member of the Bentley Group)
ST. SAVIOUR'S ROAD, LEICESTER
Telephone: Leicester 38161 Telegrams: Automatic Leicester, Telex.

MBK 17

FOR EASY SOLDERING . . .

TINNED STEEL STRIP IN COIL

Soldering is greatly simplified by the use of Tinned Steel Strip, which eliminates the tinning normally done by the operator. The tin coatings adhere completely to the strip, allowing stamping, drawing and deep drawing operations. Tinned Steel Strip from Willmott Taylor has proved outstandingly successful in a diversity of applications. It will save *you* time, money and labour.

Supplied in widths ½" to 6" in gauges up to 18 s.w.g., and in widths up to 8" wide in gauges 30 s.w.g., 28 s.w.g. and 26 s.w.g.

We also supply 'Presbrite' Nickel Plated and Chrome Plated Steel in coils.

Willmott Taylor LIMITED

Wharfdale Road, Tyseley, Birmingham 11 **Telephone: ACOcks Green 1186**

L.G.B.

The long & short of it . . .

. . . is the result of a lifetime's experience

In fact over 80 years special study of the most efficient and economic production of Drying Cylinders, Dyeing Machine Linings and Tanks is at your service. Let us quote for your next job.

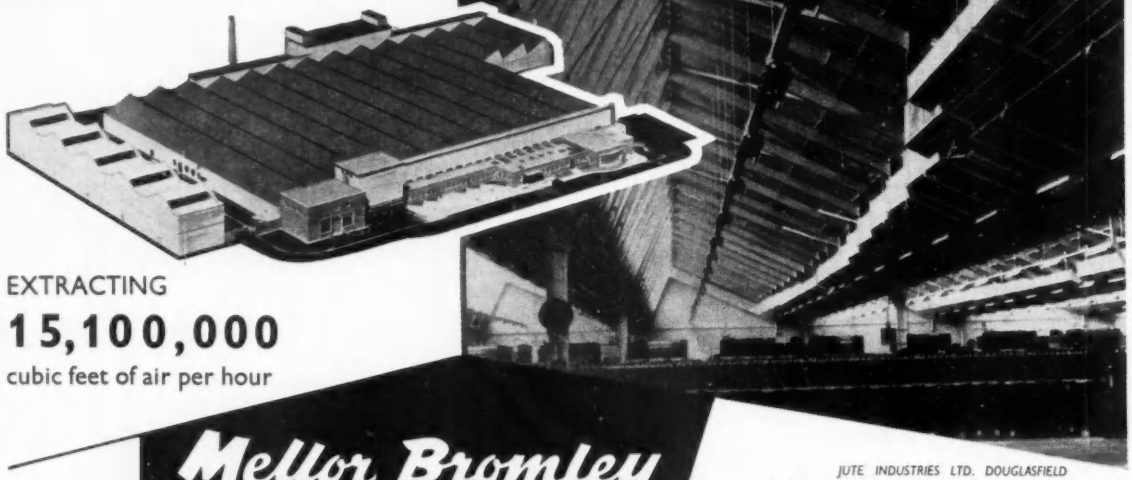
DRYING CYLINDERS
IN ANY METAL—AND ANY SIZE

ROBERT PRITCHARD & SONS LTD.

GOODLAD STREET, WOOLFOLD, BURY. TELEPHONE: BURY 1695/6.

AIR CONDITIONING BY

SUPPLYING
18,800,000
cubic feet of air per hour



EXTRACTING
15,100,000
cubic feet of air per hour

Mellor Bromley

JUTE INDUSTRIES LTD. DOUGLASFIELD
Architects and Consultants: Sir Alexander Gibb & Partners, London

MELLOR BROMLEY (AIR CONDITIONING) LTD.

HEATING, VENTILATING AND AIR CONDITIONING ENGINEERS AND CONTRACTORS

BARKBY ROAD, LEICESTER. TELEPHONE: LEICESTER 66651

MEMBER OF THE BENTLEY GROUP
AC58

Comb Circles
Fallers
Gill Screws
Gears
Rollers
Tentering Hooks or Gills
Porcupines
Brass Bearings (all types)

We invite you to test these products which are made by our team of highly skilled craftsmen.

New and reconditioned worsted machinery, repairs, levelling, removing and packing for export.

Send for Illustrated Brochure

JAMES HOLDSWORTH
& SONS (HALIFAX) LTD.
BRITANNIA WORKS, GARDEN STREET, NEW BANK, HALIFAX
Tel: Hx. 2604

Fast-and 100% Accurate!

ENM LINEAL MEASURE COUNTER

CONSTANT VISUAL RECORD

INSTANTLY RESETTABLE

CONTROLLED BY MATERIAL OR MACHINE

SERIES 428

Britain's Largest Manufacturers of Counting and Numbering Machines

Use the ENM Counting Devices for visually recording lineal measurement of textile fabrics, paper, wire, rope, twine, etc. Can be used for frictional measurement or integrally attached by coupling or gears to record in units of yards, metres, feet or fractions thereof. Whatever your counting problem, count on ENM for a solution. Why not write today?

ENGLISH NUMBERING MACHINES LTD.
DEPT. 8D · QUEENSWAY · ENFIELD · MIDDLESEX
Tel: Howard 2611 (5 lines) · Telegrams: Numgravco, Enfield

Waggons!

KILBOURN MARTIN waggons are available in a wide range of models for all purposes. The canvas container waggon illustrated has a projection-free interior which greatly reduces sub-standards due to dirty handling. The container can be removed for laundering—there's a saving of time, material and trouble.

KILBOURN MARTIN LTD.

Why not write for details of a waggon to meet your own particular needs?

material handling experts

FOR THE KNITWEAR AND TEXTILE INDUSTRIES

SANVEY GATE · LEICESTER · Telephone 22538

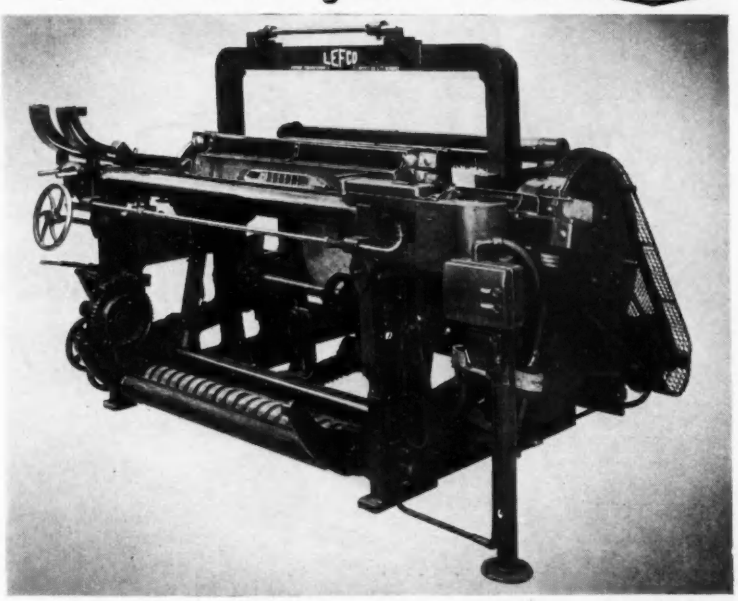
FULLY AUTOMATIC UNDERPICK JUTE LOOM

LEFCO

incorporating

"ECCO" X

Solid Cop Extractor Type Shuttle Loader.



46½" r. s. Automatic Loom

Accessories–

Pickers, Shuttles, Bobbins and the full range of

DRESSING
BEAMING
WEAVING
FINISHING and
BAG MAKING
MACHINERY for Jute and similar Fibres.

THOMAS C. KEAY LIMITED

and their subsidiary

LAWSIDE ENGINEERING and FOUNDRY CO., LTD. · Dundee · Scotland

FOR Diecastings as strong as steel

ALUMINIUM BRONZE CO., LTD.

Wallows Lane · Walsall · Staffs.

Telephone: WALSALL 2108 (3 lines)
Telegrams: "ABCO · WALSALL"

Every Job an Engineering Job
We Tackle anything
that can be made

JOHNSON & HARTLEY
LIMITED
TEXTILE ENGINEERS

C2 ALBION WORKS, MOTTRAM STREET, STOCKPORT. Tel STO 5251/2

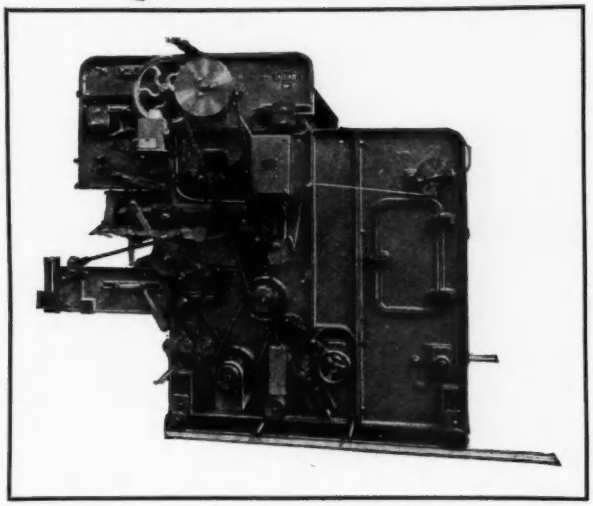
ANOTHER SUCCESSFUL PRODUCT OF TATHAM RESEARCH

Electro-Magnetically Controlled

AUTOMATIC FEEDING MACHINE

gives substantially more accurate initial feed to Carding Engines

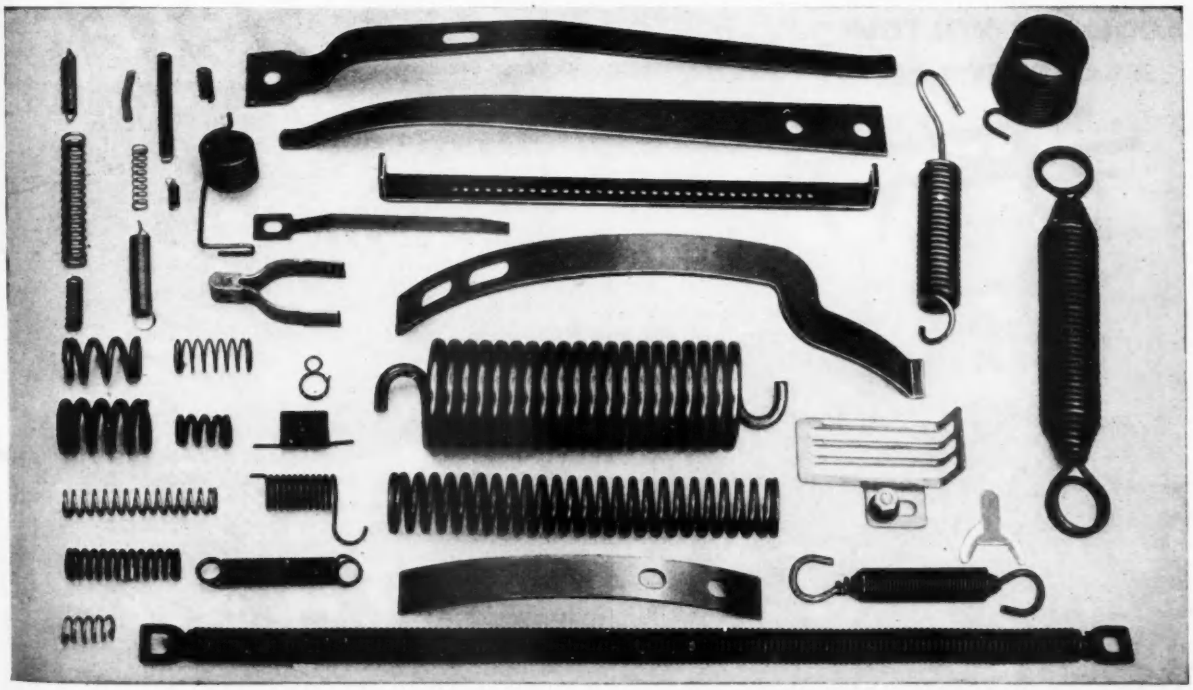
Specially designed to meet the widespread demand for a substantially more accurate feeding medium for all classes of woollen and other fibres, this Automatic Feeding Machine is electro-magnetically controlled by super-sensitive Scale Pan. Full details, specifications, etc., are given in an illustrated leaflet No. AF/4/58, available on request.



TATHAM

WILLIAM TATHAM LTD., BELFIELD WORKS, ROCHDALE

SPRINGS FOR NORTHROP LOOMS—Consult the Spring Specialists



CRABTREE BROS. (WATERSIDE) Ltd.

EST. 4868 **WATERSIDE, COLNE, LANCASHIRE** *Phone:* Colne 7559-1054

To The TEXTILE MANUFACTURER

WE OFFER :—

INDIVIDUAL DRIVING and EFFICIENT LIGHTING

Designed by experts who know the requirements of the Textile Trade

MAY WE GIVE YOU A QUOTATION FOR YOUR FIRE ALARM SYSTEM
and SMOKE DETECTION ALARM SYSTEM

SOUTHERN & REDFERN LTD

Electrical and Mechanical Engineers and Contractors

WOODHEAD ROAD, BRADFORD, 7 YORKS.

Telephone Bradford 23871/5

APPROVED CONTRACTOR

GUARANTEED WORK

Authorised Distributors of "FRIGIDAIRE" Regd. Commercial and Domestic Refrigerators.

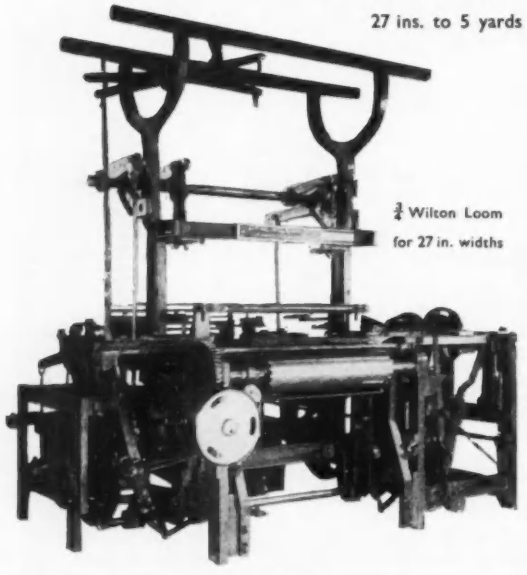
A New CATALOGUE

This comprehensive Catalogue, published by the Pioneers of Industrial First Aid, includes a section summarising British First Aid Regulations. It is available free to purchasers of First Aid equipment who apply on their Company's letterhead and refer to this journal.

CUXSON, GERRARD & CO. LTD.
OLDBURY
BIRMINGHAM
ENGLAND
Established 1878
'Phone : BROadwell 1355

JACQUARD WILTON CARPET LOOMS

In all widths from 27 ins. to 5 yards

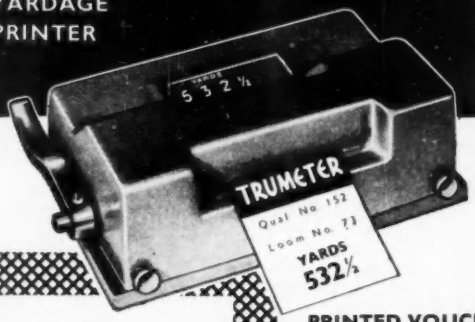


¾ Wilton Loom for 27 in. widths

WM. SMITH & BROTHERS LTD.
SUN IRON WORKS
HEYWOOD Phone 6886/7 LANCS

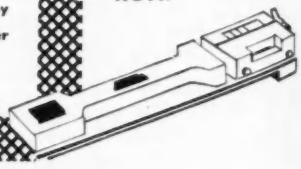
TRUMETER

STANDARD MODEL
YARDAGE PRINTER



Illustrated is the "business end" of a famous machine —proved and trusted by the textile trade all over the world.

PRINTED VOUCHER DELIVERED AT ANY POINT ON RUN.



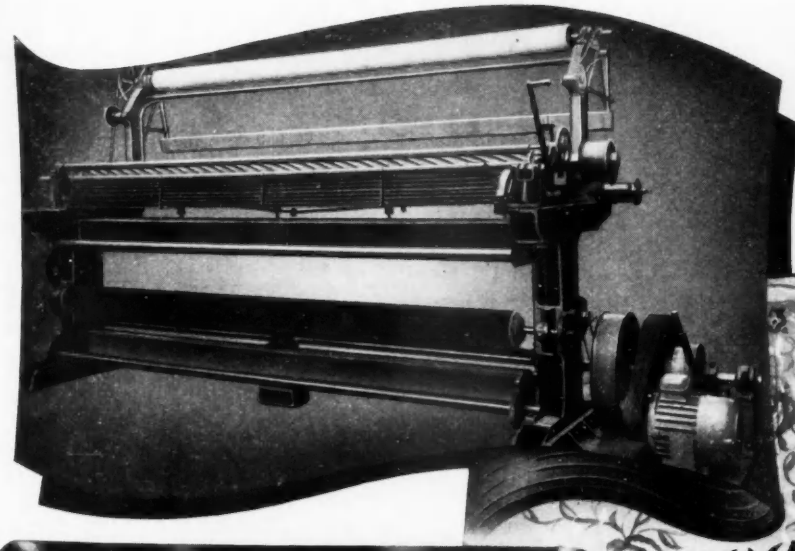
TRUMETER CO. LTD.,
MILLTOWN STREET, RADCLIFFE, Nr. MANCHESTER.
Telephone: Radcliffe 2675 CW 5328

HAIGH
Modern
CARDING
MACHINES
for
MAXIMUM PRODUCTION
and EFFICIENCY
Makers of all types of Carding Machines for Woollens, Worsteds and Felts, with Iron or Wood Cylinders and Rollers, Self-acting Teasers or Shakers, Fearnoughts or Tenter Hook Willows : Grinding Frames, etc.

JOHN HAIGH & SONS LIMITED

PRIEST ROYD IRON WORKS · HUDDERSFIELD

TELEPHONE HUDDERSFIELD 1503 · TELEGRAMS HAIGHS, MACHINISTS, HUDDERSFIELD



CRAIG CARPET SHEARING MACHINES SET A NEW STANDARD OF EFFICIENCY AND RELIABILITY FOR ALL WIDTHS

SHEARING MACHINES

FOR

Wilton and Axminster Carpets

A.F. CRAIG & CO. LIMITED

Caledonia Engineering Works

TELEPHONE: PAISLEY 2191
TELEGRAMS: CRAIG PAISLEY

PAISLEY SCOTLAND

London Office: 727 Salisbury House, London Wall, London EC2. TELE. NATional 3964

SPECIALITIES
for the
TEXTILE INDUSTRY

ORAPRET
Softening, delustring and waterproofing agents.

FIXORAN
The non-slip finish which does not impair handle.

SIGNORAN
For marking pieces. Qualities to suit most fabrics and processes.

TRIORAN
Spotting agents.

Samples and literature sent on request

THE HEXORAN CO. LIMITED
Unity Works, Belper, Derbyshire
Telephone: Belper 471 *Telegrams: "Progress, Belper"*

Symbol of Service

FROST'S
SILK, NYLON, TERYLENE

Licensed Producers of
FLUFLON Regd. **FLUFLENE** Regd.
AGILON Regd. **YARNS**

WM. FROST & SONS LTD.
Park Green Mills, MACCLESFIELD.
Phone: Macclesfield 2284 (3 lines) Grams: Frost, Macclesfield

MEET THE REQUIREMENTS OF THE
CLEAN AIR ACT

Lock
SMOKE METER AND ALARM WILL WARN YOU

Simple to install, it gives a continuous record of smoke density, sounding alarm automatically if smoke becomes excessive
ASK FOR LITERATURE.

A. M. LOCK & CO. LTD.
ELECTRONIC ENGINEERS
PRUDENTIAL BLDGS., 79 UNION STREET, OLDHAM, LANCS.
Tel.: MAIn 6744.
CW3975/AM

CHLORETHOL
ensures:-

1. **A Cleaner Scour.**
2. **Better handle on all Piece Goods.**
3. **Silk and Cotton effects made clearer.**
4. **Disagreeable smells removed.**
5. **Ensures more level dyeing.**

Chlorethol is a highly concentrated solvent in fluid form, soluble in water or alkali solutions.

It ensures the complete saponification and removal of any mineral oil present in the material, which, in the normal scour remains in the goods. It is a powerful solvent for paint, tar, gums, etc.

It is being used with excellent results in the scouring of:

Loose Wool, Yarn, Woollen Piece Goods, Pure Worsteds, Scotch Tweeds, Flannels and Flannel Shirtings, and in the damping out of Cotton Goods. Quantity to be used: Approx. 1 lb. Chlorethol per 100 lb. of material.

BREAKS BROS. LTD.
CHEMICAL MANUFACTURERS
BOLTON WOODS - SHIPLEY - YORKSHIRE
Telephone: 53241 Shipley Telegrams: "Carmine" Bradford

TUNGSTEN CARBIDE YARN INSERTS

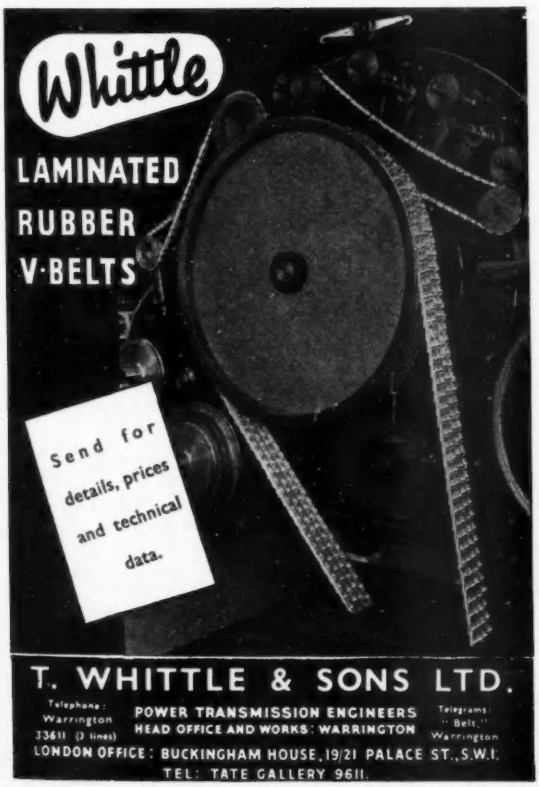
Conclusive tests have proved Halco yarn inserts to be groove resistant when standard guides have shown wear. It will pay you to specify Halco—remember they are made from Tungsten Carbide, the hardest material manufactured today.

Agents for Scotland, Northern Ireland and Eire
GALATEX ENGINEERING AGENCIES LTD., LANGHAUGH MILL, GALASHIELS, SCOTLAND.
Telephone : Galashiels 2045

Agents for Australia
TEXTILE ACCESSORIES Pty. Ltd., SYDNEY & MELBOURNE

Send your enquiries to :—

HALIFAX TOOL CO. LTD
SOUTHOWRAM - HALIFAX - *Tel.* HALIFAX 62177/8



T. WHITTLE & SONS LTD.
Telephone: Warrington 33611 (3 lines)
POWER TRANSMISSION ENGINEERS
HEAD OFFICE AND WORKS: WARRINGTON
Telegrams: "Belt" Warrington
LONDON OFFICE: BUCKINGHAM HOUSE, 19/21 PALACE ST., S.W.1.
TEL: TATE GALLERY 9611.

T.M. 23

CHROME CALF HIGH DRAFT APRONS

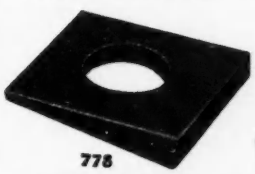
Chrome calf leather aprons have two important advantages over synthetic aprons, in so far as they keep cleaner and do not tend to splay or stretch. Supplied spliced and cemented for immediate use—no dismantling of frame.

SPLICED AND CEMENTED. *for speedy fitting!*

ENABLES FIXING BOTTOM APRONS WITHOUT DISMANTLING

PEERS KNOWLES LIMITED
ST. JAMES STREET, ACCRINGTON. Phone: 4277

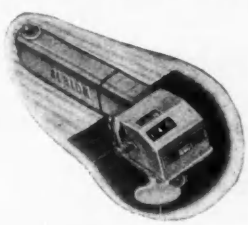
TAPER WASHERS

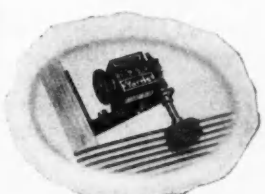


from stock in all sizes from ¼ in. to 2¼ in.

HENRY LINDSAY LTD.
P.O. Box No. 97
Mansfield Road, Bradford 8, Yorkshire
Telephone: BRADFORD 41251 (5 lines)
Telegrams and Cables: Lindsay Bradford Telex (Telex No. 51147
Makers of the Lindapter Bolt Adapter

INDUSTRIAL COUNTING INSTRUMENTS and MEASURING UNITS





Let us solve your Counting and Measuring Problems

Send for Catalogue to Instrument Division

Telephone BOLTON 4344

B. & F. CARTER & Co. Ltd. BOLTON 22

STOCKPORT UNITED CHEMICAL CO. LTD.

(A Member of the Associated Chemical Companies Limited Group.)

Manufacturers of Chemicals for

PROCESSING · DYEING AND FINISHING OF TEXTILES

STOCKPORT UNITED CHEMICAL CO LTD., CANADA STREET, HEAVILEY, STOCKPORT

Raycol REGD **RAYON SIZES**

Gamma REGD **RAYON SIZES**

READY MIXED SIZE PASTES FOR ALL PURPOSES FOR WARP, WEFT OR KNITTING

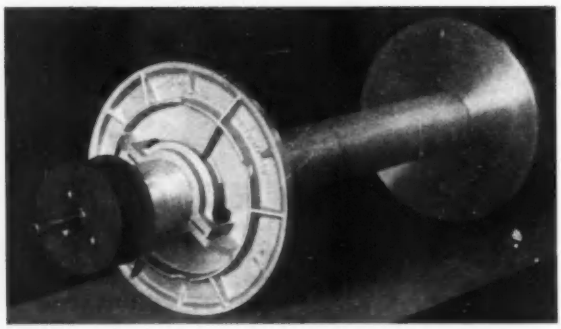
SPECIALITY COMMISSION SIZING FOR HOME OR EXPORT. COMMISSION WINDING TO CONE, OR CHEESE

C.S.L. LTD

CREPE SIZES LTD

FRIAR ST. WORKS · LENTON · NOTTINGHAM

PHONE : NOTTINGHAM 75850 GRAMS : 'LINIUM' NOTTINGHAM



LUPTON & PLACE LTD.

BURNLEY EST. 1892

Grams: "CLIMAX, BURNLEY." Tel.: BURNLEY 3229/0

ALUMINIUM for the TEXTILE TRADE

WEAVERS' and WARPERS' BEAMS, REELS, FLANGES BOBBINS, etc., in specially suitable aluminium alloys

Sole makers of

"CLIMAX" DOBBIES — 1 to 4 CYLINDERS

and "CLIMAX" SUPER SPRING TOP MOTIONS

HENRY LINDSAY LTD.

P.O. Box No. 97

Mansfield Road, Bradford, 8, Yorkshire

OFFER

Black or Bright **BOLTS & NUTS** Special Finishes

MANY ITEMS IN GREAT VARIETY FROM STOCK

Large and small orders equally welcome

1350

Prompt attention given to detailed needs

Makers of the Lindapter Bolt Adapter

Telephone: BRADFORD 41251 (5 lines)

Telegrams and Cables: Lindsay Bradford Telex (Telex No. 51147)

MANUFACTURER'S OFFER OF

STEEL SHELVING

- *Brand new—Manufactured in our own works*
- *Shelves adjustable every inch*
- *Heavy gauge shelves will carry 400 lb. each*
- *Stove enamelled dark green*
- *6 shelves per bay—Extra shelves 8/- each*
- *Quantity discounts*

72" High
34" Wide
12" Deep

Telephone: 69018 (3 lines

PRICE £3 15s. Ready for Erection

Also available in white at £5 per Bay.

Deliveries free to England, Scotland and Wales

N. C. BROWN LTD.

SOUTH WING · EAGLE STEELWORKS HEYWOOD · LANCS.

Index to Advertisers

Italic Figures denote advertisements on literary pages

Adolff, Emil
Aluminium Bronze Co. Ltd. 96
Anchor Chain Co. Ltd. 46
Andre Rubber Co. Ltd. Inside Back Cover
Angus, George & Co. Ltd.
Appleby, Joseph, Ltd.
Arkwright, Sir R. & Sons Ltd.
Armstrong Cork Co. Ltd. 17
Arrow Electric Switches Ltd.
Arundel, Coulthard & Co. Ltd. 8, 9
Ashworth, Arthur Ltd.
Aspinall, A. E. Ltd.
Associate Rediffusion Ltd.
Ateliers Roannais de Constructions Textiles 15
Atcost Ltd.
Audley Spinning and Manufacturing Co. Ltd. 47

Balmes (England) Ltd.
Basford, Dyers Ltd.
Bayard Publicity Ltd.
Benninger Engineering Co. Ltd.
Bennis Combustion Ltd. 40a
Benton & Stone Ltd.
B.E.N. Patents Ltd. 14
Birfield Industries Ltd. 63
Birkett, Billington & Newton Ltd.
Birmingham & Blackburn Construction Co. Ltd.
Birmingham Battery & Metal Co. Ltd.
Blackburn, Thos. (Brighouse) Ltd. 86
Blakelys Textiles Ltd.
Bleachers' Association Ltd.
Blomfield, Maurice Ltd.
Bodden, Wm. & Sons Ltd. 1
Boettcher, H.
Boucher & Co. Ltd. 52
Bound Brook Bearings (G.B.) Ltd. 63
Boyd, J. & T. Ltd.
Bradford Dyers Association Ltd.
Brammer, H. & Co. Ltd.
Breaks Brothers Ltd. 100
Bright, John & Bros. Ltd. 60
British Celanese Ltd.
British Electrical Development Association 78
British Geon Ltd.
British Insulated Callender's Cables Ltd. 75
British MonoRail Ltd.
British Northrop Ltd. 51
British Nylon Spinners Ltd.
British Overseas Airway Corporation 79
British Picker & Co. Ltd.
British Railways 40b
British Road Services
British Rolling Mills Ltd. 7
British Stationery Council
British Thomson-Houston Co. Ltd.
Broadbent, Thos. & Sons Ltd. 66
Brown, N. C. Ltd. 102

Cambridge Instruments Ltd.
Carter, H. R. & Son Ltd.
Carter, B. & F. & Co. Ltd. 101
Carter Gears Ltd.
Casablancas High Draft Co. Ltd. 28
Churchfields Spring Co. Ltd.
Cinema-Television Ltd.
Clancey, G. Ltd. 104
Clifford, Charles Ltd.
Colodense Ltd. 33
Combined English Mills Ltd. 20, 21
Crabtree Bros. (Waterside) Ltd. 97
Crabtree, David & Sons Ltd. 76
Cradley Boiler Co. Ltd. 84
Craig, A. F. & Co. Ltd. 99
Crepe Sizes Ltd. 102
Crofts (Engineers) Ltd.
Crompton Parkinson Ltd.
Crowther Ltd.
Cuxson, Gerrard & Co. Ltd. 98

Dalglish, John & Sons Ltd.
Danks, Edwin & Co. (Oldbury) Ltd.
Davidson & Co. Ltd.
Darwin & Sons
Davidson, MacGregor & Co. Ltd. 88
Dayton Rubber Co. Ltd. 24
Devoge & Co. Ltd.
Dick, R. & J. Ltd.
Dixon, John & Sons Ltd. 89
Dodd, S. & Sons Ltd.
Dracup, Samuel & Sons Ltd. 72
Drayton Regulator & Instrument Co. Ltd.
Dronsfield Bros. Ltd. 104
Dunlop Rubber Co. Ltd.
Durrant, George & Sons Ltd.

Eadie Bros. & Co. Ltd.
Ekco-Ensign Electric Ltd.
Electric Construction Co. Ltd.
Ellison, George Ltd. 58
Eloflock, G.m.b.H.
Emmott & Co. Ltd. 40b
Emmott, G. (Pawsons) Ltd. 85
English Electric Co. Ltd. 38
English Numbering Machines Ltd. 94
Erskine Heap & Co. Ltd.
Erhardt & Leimer Ltd.
Evans, F. W. Ltd. 85
Evertaut Ltd.

Fairitt Eng. Co. Ltd.
Farmer, Norton, Sir James & Co. Ltd.
Fawcett, Preston & Co. Ltd. 50
Fearnehough, W. Ltd. 62
Ferguson Pailin Ltd. 62
Fine Spinners & Doublers Ltd.
Firth, Richard & Sons Ltd.
Firth Vickers Stainless Steels Ltd.
Fischer Bearings Co. Ltd.
Fischer, George Ltd.
Fleissner Ltd.
Fletcher Miller Ltd.
Flexibox Ltd. 82
Formica Ltd. 3
Foxboro-Yoxall Ltd. 19
Foxwell, Daniel & Son Ltd.
Frankfurt Trade Fair
Fraser, Douglas & Sons Ltd.
Freeman, Taylor Machines Ltd. 87
Frost, Wm. & Sons Ltd. 100

Gas Council, The 59
General Electric Co. Ltd. 13
Gilbos, Sprl.
Gill, Thomas & Sons Ltd.
Glacier Metal Co. Ltd.
Goodyear Tyre and Rubber Co. (G.B.) Ltd. 70, 81
Granwood Flooring Co. Ltd.
Green, E. & Son Ltd.
Greenwoods Standard Gearcutting Co. Ltd. 85
Grob & Co. Ltd.
Guest, Keen & Nettlefolds Ltd.
Gusken, Jean, G.m.b.H.
G. W. B. Furnaces Ltd.

Haigh, John & Sons Ltd. 99
Hagues Textiles Ltd.
Halifax Tool Co. Ltd. 101
Hall & Kay Ltd.
Hampson, Wm. (Oldham) Ltd. 91
Handy Angle Ltd.
Hanover Trade Fair
Hardaker, J. T. Ltd.
Hardings (Leeds) Ltd.
Hattersley, George & Sons Ltd. 2
Hattersley Pickard & Co. Ltd. 86
Headland Engineering Developments Ltd.
Heath, G. H. & Co. Ltd.
Heywood Textile Accessories Ltd.
Heywood, W. H. & Co. Ltd.
Hexoran Co. Ltd. 100
Hibbert, Joseph & Co. Ltd.
Higgs Motors Ltd.
High Duty Alloys Ltd.
Hindle, Son & Co. Ltd. 32
Hodgkinson, James (Salford) Ltd.
Hoffmann Manufacturing Co. Ltd. 10
Holdsworth & Gibb Ltd.
Holmes, W. C. & Co. Ltd.
Holdsworth, James & Sons (Halifax) Ltd. 94
Holt, Thomas Ltd. 18
Hordern-Richmond Ltd.
Howorth, James & Co. Ltd.
Hudson, Irvin Ltd.
Hughes & Lancaster Ltd.
Hunt & Moscrop Ltd.

Imperial Chemical Industries Ltd. 71
India Mills (Darwen) Ltd.
Industrial Fan & Heater Co. Ltd.
Intermit Ltd.
Ioco Ltd.

Johnson & Hartley Ltd. 96

Kaye, E. & E. Ltd.
Keay, Thomas C. Ltd. 95
Keith Blackman Ltd.
Kelvin & Hughes Ltd.
Kilbourn Martin Ltd. 95
Kings Patent Agency Ltd.
Kleinewefers, Joh.
Knowles, Frank & Co. Ltd.
Knowles Peers Ltd. 101
Kovo Ltd.

Lancashire Cotton Corpn. Ltd.
Lancashire Dynamo & Crypto Ltd.
Lang Bridge Ltd.
Laporte Chemicals Ltd. 73
Lawson, R. P. & Sons Ltd.
Ledray, Samuel & Sons Ltd.
Lenson Engineering Co.
Lep Transport Ltd.
Light Alloy Construction Ltd.
Lindsay, Henry Ltd. 84, 101, 102
Linz, L. & Sons Ltd. 84
Livesey & Aspinall Ltd.
Lock, A. M. & Co. Ltd. 100
Lodge Plugs Ltd.
Longclose Engineering Co. Ltd. 22
Lupton Bros. Ltd.
Lupton & Place Ltd. 102

Macart Textile (Bradford) Ltd.
Mackie, James & Sons Ltd. 74
Magnesium Elektron Ltd.
Manchester Metal Works Ltd.
Manchester Oil Refinery (Sales) Ltd.
Mandleberg, J. & Co. Ltd.
Manganese Bronze & Brass Co. Ltd. 35
Manlove, Alliott & Co. Ltd.
Mather & Platt Ltd. 39
Maynard, R. S.
May & Baker Ltd.
Mellor, Bromley & Co. Ltd. 92, 94
Metcalf, George & Co. Ltd.
Metropolitan Vickers Electrical Co. Ltd. 83
Meynell & Son Ltd.
Middleton Bowl Works Ltd. 90
Midland Bank Ltd.
Mills, Wm. Ltd.
Monsanto Chemicals Ltd.
Moore & Avery Ltd.
Morris, Herbert Ltd.
Mountford, Frederick (Birmingham) Ltd.
Muller, Franz 11
Mutual Mills Ltd. 5

National Industrial Fuel Efficiency Service
Negretti & Zambra Ltd. 6

(*continued on page* 104)

Index to Advertisers

(*continued from page* 103)

Norman Evans & Rais Ltd.
Northern Mill Supply Co., The 34
Northern Photo Engraving Co. Ltd.
North Western Electricity Board
Notcutt, R.C. Ltd. 85

O'Brien, J. Owden & Son Ltd. 84
O'Neill, Samuel & Sons Ltd.
Obermaier & Co.
Ogden, M. & Co. Ltd.
Oppenheimer Casings Ltd.
Orme, George & Co.

Padley & Venables Ltd.
P.A.M. Ltd.
Pegg, Samuel & Son Ltd. 25
Permoglaze Ltd.
Perry Chain Company Ltd.
Petrie & McNaught Ltd. Back Cover
Petrofina (G.B.) Ltd. 49
Phillips, B. L. & N. Ltd. 54
Pilkington Bros. Ltd.
Platt Bros. (Sales) Ltd. 42
Platt, J. W. & H. Ltd.
Power Petroleum Co. Ltd. 31
Powder Couplings Ltd. 92
Prince-Smith & Stells Ltd. 26, 27
Pritchard, Robert & Sons Ltd. 93
Proctor, James Ltd.
Prodorite Ltd. 34

Quick Wrap Tubing Co. Ltd. 80

Ransome & Marles Bearing Co. Ltd. Inside Front Cover
Ransome, Sims & Jefferies Ltd.
Renard, B. & Co.
Renold Chains Ltd. 69
Revol Ltd. 37
Reynolds, T. I. Aluminium Ltd.
Riley, T. W. Ltd.
Ruti Machinery Works Ltd. 65
Ryder, Thomas & Son Ltd.
Ryder, Wm. Ltd.

Salter, Geo. & Co. Ltd. 43
Sanco Trading Co. Ltd.
Sanderson & Co. (Textile Engineers) Ltd.
Scharer Textile Machine Works 57
Schlafhorst, W. & Co.
Schlumberger, W. & Cie
Schweiter Ltd. 55
Scott, Hugh J. & Co. (Belfast) Ltd.
Scragg, Ernest & Son Ltd.
Sellers & Co. (Huddersfield) Ltd. 68
Sellers, Joseph & Son Ltd. 87
Sheepbridge Alloy Castings Ltd.
Shell Chemical Co. Ltd. 44
Shirley Developments Ltd.
Siemens Edison Swan Ltd. 77
Silentbloc Ltd.
Simonett, A. & H. (Engineers) Ltd. 64
Sintered Products Ltd.
Skefko Ball Bearing Co. Ltd.
Slinger, W. & Sons Ltd.
Smith, S. & Sons (England) Ltd. 23
Smith, Wm. & Bros. Ltd. 98
Southern & Redfern Ltd. 98
Spencer-Bonecourt-Clarkson Ltd. 48
Spencer & Halstead Ltd.
Square, D. Ltd.
Standard Bank of South Africa Ltd.
Standard Chemical Co. 85
Steatite & Porcelain Products Ltd.
Stedall Machine Tool Co. 64
Stephens, Ira Ltd.
Stephenson Bros. Ltd.
Sterling Metals Ltd.
Stockport United Chemical Co. Ltd. 102
Stone-Wallwork Ltd. 61
Stott, James, & Co. Ltd.
Stowaca Fibre & Can Co. Ltd. 36
Stubbs, Joseph Ltd.
Sturtevant Engineering Co. Ltd. 4
Suiza, Hispano S.A. 90
Sulzer Brothers Ltd.
Swailes Ltd.

Taylor, F. & Son (M/c) Ltd.
Tatham, Wm. Ltd. 97
Taylor Wordsworth & Co. Ltd. 27
Tecalemit Ltd. 56
Teleflex Products Ltd. 41
Terry, Herbert & Sons Ltd. 91
Textile Industrial Components Ltd. 12
Textile Paper Tube Co. Ltd.
Textile Recorder Exhibitions
Textile Machinery (M/c) Ltd.
Thames Board Mills Ltd.
Thornton, G. W. & Sons Ltd. 45, 57
Tomlinsons (Rochdale) Ltd. 82
Tootill & Snape Ltd. 85
Trumeter Co. Ltd. 98
Tufnol Ltd.
Turner Bros. Asbestos Co. Ltd.
Tweedales & Smalley Ltd.

Uhlhorn Bros. Ltd. 84
Unbrako Socket Screw Co. Ltd.
United Coke & Chemicals Co. Ltd. 89
Universal Winding Co. Ltd. 29
Uttley, F. & Son Ltd.

Vaughan Crane Co. Ltd.
Vulcanised Fibre Ltd. 16

Wadsworth & Co. Ltd.
Walker, Crosweller & Co. Ltd.
Walker, P. M. & Co. (Halifax) Ltd. 60
Walker, Thos. & Son Ltd. 53
Wareing Bros. & Co. Ltd. 36
Wareing, Thos. & Co. Ltd.
West Yorkshire Foundries Ltd.
Whiteley, B. S. & W.
Whiteley, E. Gordon Ltd. 30
Whiteley, Wm. & Sons Ltd. 88
Whitaker, J. O. (Accrington) Ltd. 84
Whittle, T. & Sons Ltd. 101
W.H.K. Products Ltd.
Wigglesworth, Frank & Co. Ltd.
Willmott, Taylor & Co. Ltd. 93
Wilson Bros. Bobbin Co. Ltd.
Wilson & Longbottom Ltd. Front Cover
Witco Chemical Co. Ltd. 40
Worthington-Simpson Ltd.

Zellweger Ltd. 45

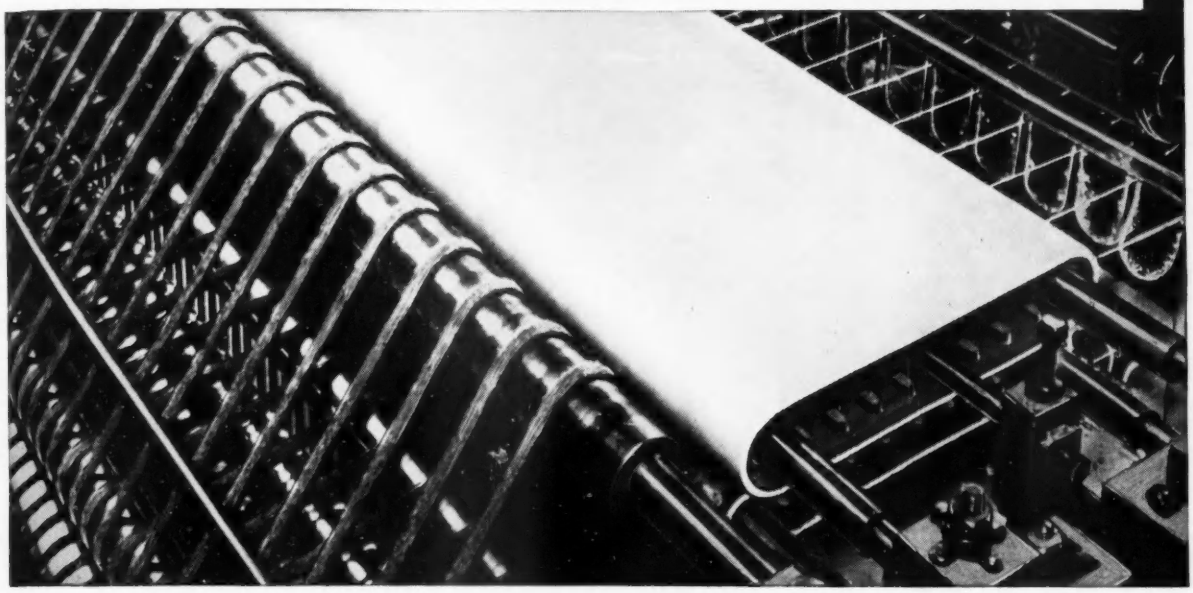
ATLAS BRAND
EMERY FILLET

DRONSFIELD BROTHERS LTD.
ATLAS WORKS OLDHAM ENGLAND

G·CLANCEY LTD.
CASTINGS
for
TEXTILES

G·CLANCEY LTD.
BELLE VALE·HALESOWEN
TELEPHONE: CRADLEY HEATH · 69411-2-3

higher production-better yarn with CONDENSER RUBBERS



—by ANDRE *of course*

Around the world in 40 textile producing countries ANDRE CONDENSER RUBBERS are being used to increase production and improve yarn. These rubbers give years of completely trouble-free service and put up to 50% more material on the condenser bobbins . . . and that means fewer creeling operations on the mule. Producing round, dense, uniform slubbing at greatly reduced eccentric speed ANDRE RUBBERS reduce condenser wear and power consumption. There is a complete range of sizes to suit every condenser.

Some other ANDRE products for the textile industry include—

SQUEEZE ROLLERS
MACHINERY MOUNTINGS

SCOTCH FEED CONVEYOR BELTS
and a wide range of moulded rubber items. French Worsted Drafting Aprons.

ANDRE RUBBER

ANDRE RUBBER COMPANY LIMITED Kingston By-Pass, Surbiton, Surrey
Telephone : ELMbridge 6580/3. Telegrams : Andre, Surbiton **(A SILENTBLOC COMPANY)**

TAS/AR.140

Published by the Proprietors, Emmott and Co. Limited, 31 King Street West, Manchester 3, and 158 Temple Chambers, Temple Avenue, London, E.C.4.
Printed in Great Britain by The Cloister Press Limited, Heaton Mersey, Stockport, December, 1958. Entered as second-class at the New York, U.S.A. Post Office.
Registered for transmission by Canadian Magazine Post.

5 famous factories are using

JESSOP BROS.
SPRINGFIELD MILLS
OSSETT

E. FOX & SONS LTD.
CALDER BANK MILLS
DEWSBURY

PETRIE & McNAUGHT

machinery

Always in the forefront of design, we are proud of the fact that so many of the famous names in the textile industry have chosen "P & M" machines for their initial processes. Whenever the washing and/or drying of textile fibres is under consideration we will place at your disposal the experience we have gained in the trade since Mr. John Petrie Junr. designed the first automatic wool washing machine in 1853.

Crawford Street · Rochdale

LEE NEPHEW & SON
LOW MILLS
RAVENSTHORPE

FITTON & SONS
PILDACRE MILLS · DEWSBURY

GEORGE HIRST & SONS
BRITANNIA MILLS · BIRSTALL · NEAR LEEDS

The 5 illustrations are mills using "P. & M" machinery and are all Subsidiaries or Branches of THE EXTRACT WOOL & MERINO CO. LTD., to whom we are indebted for permission to reproduce the photographs and use their names.

1976

Petrie & McNaught Ltd. are represented in New Zealand by I.C.I. (N.Z.) Ltd. P.O. Box 1592 Wellington (and at Christchurch)

LLS

rch)